The Builder.

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The Recent Discussion at the Institute.

THE proceedings of the special meeting of members only, held at the rooms of the Institute of Architects on March 31, are now in the hands of all members, and may, therefore, be considered so far public property as to be the subject of public comment. The minor business, but first in order, of the meeting was to consider a recommendation from the Council that the Institute should enter into a lease with the Architectural Union Company for a further portion of the premises of 9, Conduit-street, hitherto in use as a shop; in other words that the permanent enlargement of the Institute premises has become a necessity, and that the opportunity should be taken of effecting this object. This was soon disposed of by a unanimous vote, and the real business of the evening then followed.

The meeting resolved itself into a special general meeting called by the Council under the provisions of by-law 60, whereby the Council shall be bound to call a special meeting to consider any proposed resolution on the receipt of a written requisition to that effect signed by twelve subscribing members, of whom the majority shall be Fellows. The subject proposed for discussion was summed up in the following resolution:—

"1. That, at as early a date as possible, statutory powers should be sought to establish, as in other professions, a system of compulsory examination to be held by the Institute, and to be extended to all architects hereafter entering the profession, whether as members of the Institute or not.

2. That when such compulsory examination comes into force, the position of all existing architects shall be completely respected.

3. That, whether these (Nos. 1 and 2) be carried or not, a poll be taken by voting-papers, in order that under any circumstances the opinion of the entire body of professional members may be ascertained."

As we recorded in general terms in a former issue, a counter resolution to these was moved by Professor Roger Smith, and carried at first by a majority of about three to one, and subsequently adopted, in the usual form, in a substantive motion, by a practically unanimous vote. The following are the terms of this amendment:—

"That, while not opposed to the principle of compulsory examination as applied to those about to practise architecture, this Institute is of opinion that the difficulty of restricting by statutory powers the practice of architecture to those who have passed an examination is at present so insuperable that it is undesirable to make an immediate application for such powers."

The first comment we have to make on these main facts of the procedure is to endeavour to clear up the minds of some people who seem to be under a very mistaken impression as to the real meaning of the two opposing resolutions, and of the act of calling the meeting at all. From one or two letters we have received it seems that some of the provincial members are under an impression that the Institute having made up its mind in favour of compulsory registration, and called a meeting to put the matter in train, had at the last moment allowed a red herring to be drawn across the track in the shape of a counter-resolution, and had stultified itself by carrying this instead of the originally proposed resolution. That anyone should think so only shows how carelessly members read the printed documents circulated by the Institute to give them information. The Council were summoned by a requisition, in the prescribed form of the by-law, to call the meeting, and had no power to refuse. The requisition was promoted and signed by the people who were concerned in getting up the Architects' Registration Bill which is again being attempted to be thrust on Parliament, and it was simply an attempt to drag the Institute at the heels of that Bill and its promoters. The list of signatories to the requisition does not include the name of a single member who is in the front rank of the profession, and a majority of them are those of persons almost unknown. Among the speakers in favour of the resolutions the only one whose opinion on a matter affecting the welfare and honour of the profession could be considered worth any serious consideration was Mr. Connon, of Leeds, who moved the resolution, and who perhaps may be in earnest in his ill-regulated zeal; but Mr. Connon seems to be quite *tête montée* in opposition to the Institute, and has shown on various occasions, in his attacks upon it, an absolute want of moderation, of logic, or of tact, which have really taken away all serious value from his utterances. Of his speech at this meeting we are glad to be able to say that it was considerably less unreasonable than others which he has made in the same room, though he did descend to the foolish claptrap of accusing the Council of being opposed to registration because they had all made their reputations and position and required nothing further: a kind of insinuation which is made simply for effect, and which those who make it do not really believe. Of the other speakers on the same side it is not worth while to take any notice here, further than to observe that if the profession of architecture is to be reduced by compulsory registration to their standard, it would probably be the desire of most of the high-minded artists in the profession to escape from any nominal adherence to its ranks, and to find some other denomination under which to range themselves than the one of "architect," which would by that time have become a badge of inferiority rather than a title of honour.

Apart from this, the main question is no doubt one that is worth serious discussion, if only to remove some of the fallacies which are rife in connexion with it. We print in another column a letter from Professor Aitchison, than whom no one has a better right to speak in regard to whatever concerns the higher interests of the profession. It is by the leaders of the profession that such a matter must be deliberated, and by their opinion that it must be settled, not by the clamour of a few obscure persons who are desirous to pose as reformers, and who are not particular as to the means they employ to recommend their tactics. *Non tali auxilio* is no doubt the feeling which is tacitly present to the minds of many who are supporting the action of the Institute against this noisy minority. If so important a step is to be taken, let it be taken at the instance and under the guidance of people whom we honour and in whose *bona fides* we can have confidence. And this is a point in regard to which the Colonial and American journals which have commented on the subject seem to be very much in the dark. We have observed in such quarters references to the "unhappy dissensions" among the English architects on the subject of registration. They are misled into this idea, probably, by those who have an interest in misleading them. Colonial critics may rest assured that nothing of the kind is the case. There are no "unhappy dissensions" among those English architects who are worthy of the name and whose talents and reputation are an honour to this

country. There may be decided differences of opinion among them, but there is no acrimony, and there is a perfect willingness to discuss the subject dispassionately in all its bearings. But this is a very different thing from putting up tamely with an attempt to force registration upon them by unworthy tactics, and by an appeal to a Parliament the members of which are mostly quite destitute of the special knowledge and culture which alone could enable them to understand and to weigh the possible effect upon architects and architecture of such a piece of legislation.

There are two distinct points to be considered in regard to the question of placing barriers by legislation to the entrance of the architectural profession: first, is it desirable at all? and secondly, is this the time for it? Professor Roger Smith's motion dealt really only with the second question. It is easy to reply that the objections existing now will exist at any time, and that to bow to them is only to postpone the encountering of them to a future day. Professor Smith gave sufficient reasons against this view; but nothing in the debate was so well put or so conclusive as what was urged by Mr. Phené Spiers in his very practical speech. He adduced the case first of the chemists, who applied for a recognition from Government in order to prevent the danger of anyone calling himself a chemist being allowed to sell poisonous drugs. The Government replied that it was impossible to make the restriction, but that if they instituted an examination they might obtain a title in course of time: which was the course adopted. Again, the Plumbers' Guild has started examinations, and has registered many plumbers, but they were not registered without passing an examination, "and it never seems to have occurred to the Plumbers' Guild," adds Mr. Spiers, "to ask that 'the position of all the jobbing plumbers in the country should be respected.' If you were to go to Parliament and ask them now to admit all architects who have been in practice (however incompetent they might be), you would be met at once with the reply that it would be impossible to register as competent architects who have never been submitted to any test or examination." We hope so. At all events that is the plain common sense of the matter. If the Institute Examination is continued for some years, and meets with proper numerical support, there would come a time when there would be a sufficient body of men in the profession who had passed an examination, to render it worth while to ask for legal recognition for them. The outsiders would then in all probability find themselves compelled to pass the Examination also.

But whether that would necessarily be to the highest interests of architecture and of the profession is still doubtful; or if we conclude that it could do no harm, it does not follow necessarily that it would do any good. That the institution of an examination for entrance to the Institute has been a good thing for the credit of the Institute, under existing circumstances, we certainly think; but we must take into account what those circumstances are. We have before our eyes the example of the Institution of Civil Engineers, who have never held, nor we believe talked of holding, any test examination for entrance to their body. Yet the fact remains that membership of the Institution is so valued and is so generally recognised as an indication, if not a guarantee, of professional ability and competency, that every engineer, we believe, becomes a member of that body as soon as he can. And this fact is the more striking because one of the great difficulties in regard to an examination for the architectural profession does not exist in regard to engineering. An architect can be tested by examination in regard to his knowledge of the practical side of his profession; but the great and highest value of architects and architecture to the nation consists (though the majority of the nation have not yet recognised the fact) in artistic genius and consequent power of artistic design; and in regard to that it is utterly impossible to set any standard of examination. Nor can you, perhaps, test by examination the possession of those qualities of readiness and resource under unforeseen difficulties, of enterprise, of boldness and inventiveness of constructive conception, which go to make up engineering genius: for it is unquestionable that genius, and not merely acquired knowledge, is an element in the character of a really great engineer: and it is perhaps the perception of this which has kept back the Institution of Civil Engineers from adopting a system of examination. But at all events the principal studies in which an engineer is engaged in preparing for his profession are practical studies, his proficiency in which could be tested by examination, whereas the highest elements of an architect's studies are artistic, and cannot be tested by examination. Yet in spite of this the Institution of Civil Engineers finds an examination test unnecessary; the profession is kept up to an adequate standard, and membership of the Institution is desired by the profession, and is accepted by the public as an indication of competency in the profession. If there is not the same feeling on the part of the architects that it is essential to be members of the Institute, nor the same feeling on the part of the public that such membership is a guarantee of competency, it is obvious, by comparison with the conditions of the engineering profession, that this difference has nothing to do with the existence or non-existence of an examination test. Then what is the reason of it?

The cause of the difference rests to some extent with the public. They know what they want in engineering works, and ask for it; and, as Sir F. Leighton said about art, what the public ask for they will get. They do not know what they want in architecture, and the highest part of architecture, architecture as an art, they mostly do not want at all. They therefore ask for nothing definite and consequently get nothing definite. But the reason lies far more with the architectural profession themselves; in their want of unity and *esprit de corps*. That a great many of them do not belong to the Institute is not the fault of the Institute; it is their own fault. Mr. Connon mentioned, in the discussion in question, that only a very small proportion of the Leeds architects were members of the Institute, and that their acknowledged leading man in that town was not: and he seemed to think this fact was a slur on the Institute. He is quite mistaken; it is a slur on his own townsmen: not because the Institute is a perfect or a perfectly-managed body, though we do consider that at the present moment it is a very well-managed representative body, and is doing its best, in a very energetic manner and amid much discouragement, to benefit the profession and the art of architecture. But it is a slur upon those who do not join it, that they should be so shortsighted and indifferent as not to see the advantages to the whole profession of united action and a united front. A well-known architect who is not a member of the Institute, said, in reply to a question why he was not, "What advantage should I get by it?" That is a narrow-minded, shortsighted, and selfish view to take. Probably he would get no direct personal advantage, but the profession at large would benefit by greater unity of action, and each individual member can contribute to that. The engineering profession has proved practically that, without any examination test or legislative recognition, the profession can hold its position uncompromisingly before the public, and that membership of its representative society is regarded as an indication of a certain standard of professional acquirement. That the case is not similar with the architectural profession and its representative society is to some extent due to the ignorance and indifference of the public about architecture, but to a far greater extent it is due to the want of unity and loyalty to a common cause among the members of the profession themselves. Their representative body is not a powerful one like that of the engineers, simply because they will not take the only way to make it so. Until that spirit of disloyalty is got rid of, test examinations will not, we fear, do very much to put the profession in a better position; and if it were got rid of, examination tests would be unnecessary, for the profession would be strong enough to hold its own in public estimation, and to keep up the standard of efficiency within its own ranks, without the necessity of legislative interference, as the experience and example of the sister profession and its Institution irrefragably proves.

NOTES FROM ATHENS.

AFTER an unusually severe winter, for Athens, the warmer spring weather and the bright sunshine has at last set in, and the near approach of Easter has brought the annual influx of University men who come full of energy and enthusiasm to visit in person the familiar Classic sites. This year Professor Middleton has brought a party of his students from Cambridge, and he is taking them round in that delightfully instructive way which is so pleasantly remembered by those who have had the advantage of participating in his former visits to Rome. They will probably stay for about a fortnight in Athens, visiting all the principal sites in the neighbourhood, such as Sunium, Ægina, Eleusis, &c., and afterwards go to Mycenæ and Epidauros, allowing a few days for a short stay in Rome on their way back in time for the commencement of Term.

The work of the English and American Schools in Athens has been going on continuously during the winter, and many public meetings have been held in both schools, where papers have been read by directors and students on various subjects of archæological interest. In addition, the directors have lectured to the students on special branches of archæology, such as sculpture, vases, inscriptions, &c., in the museums, and on the topography of the various sites. Complete harmony exists between the two schools, and they have worked together amicably and pleasantly through the winter.

The American School resumed their excavations on the site of Platæa in February and carried on work there for about a month. They were greatly hampered by bad weather, especially during the early part of the time, when the ground was covered with snow for several days. Advantage was taken of the presence of an architect, as a student of the school, to make a complete survey both of the walls of the city, which date mostly from the time of Alexander, and of the whole region where the battle was fought, and important historical data have been verified and doubtful positions more definitely fixed.

A large number of remains of ruined Byzantine churches have been unearthed, and also a considerable quantity of Roman and Byzantine pottery and lamps. This points to the existence of a large Byzantine town on the site of the older city, and, we should think, makes the chances of discovering much work of good Greek times less probable. But until more extensive investigations than opportunity has hitherto allowed have been made, it would be a pity to abandon the site.

In one of these churches which lies at the south-east corner of the city, near the wall, was found, forming part of a grave beneath the floor, a slab containing another portion of the Edict of Diocletian, the preamble of which was discovered last year on a slab in the floor of another church. This inscription, which is in three columns, supplies about a column and a quarter of hitherto unknown matter, consisting principally of a list fixing the maximum prices of different textile materials. In the same church was also found another inscription of over seventy lines, dating from probably the end of the third century or the beginning of the second century B.C.; it contains a dedication by a number of women to a goddess, whose name

is not given, of votive torches, lamps, &c. It is especially interesting as giving us a large number of female names, some of which are new to us.

A number of small inscriptions were also discovered, some belonging to funeral stelæ, and one dedicated by a victor in the games of the festival of the Eleutheria. Part of a water conduit was also unearthed running into the city, under the walls, from the direction of the hills. It is formed of U-shaped terra-cotta tiles resting on the solid rock, and covered over with stone.

Several trenches were sunk in the part of the city where Leake places the temple of Hera, but without result. However, in a small church near this, where some architectural remains were also discovered, was found, among the débris, a foot of a large archaic seated statue in poros stone. Trenches were also sunk in what seemed a promising site for a temple, in the north-west part of the town, but owing to the depth of soil, bad weather, and limited time, operations had to be suspended in the meantime. It is hoped that further excavations will be made by the American school on this interesting and extensive site, where much must still remain hidden which may throw valuable light on the history of Platæa in Greek times.

The British School have commenced operations on the site of Megalopolis, in Arcadia. This is their first excavation on Greek soil, and the results of the first few days seem to promise well for the future. Almost immediately under the present level of the ground on the north side of the river Helisson, where the Agora was situated, the foundations of a large stoa have been discovered running for a considerable distance in a straight line east and west, and it seems to have had two rows of columns, the outer Doric and the inner Ionic. The remains already found point to a Roman restoration. Foundations have also been unearthed of what promises to be the plan of a temple, but operations at these two places cannot be proceeded with further at present owing to the standing crops of corn, interference with which would necessitate heavy compensation. Attention has consequently been directed to the site of the theatre on the south side of the river. This was the largest theatre in Greece, and there seems every chance of finding the complete arrangement of the stage walls as they stood in the fourth century B.C. These stage buildings, as far as can be at present seen, seem to differ entirely in arrangement from those of already excavated theatres. Behind the line of the stage wall an isolated unfluted column was found, with three deep holes on the top. This may possibly have had something to do with the machinery of the stage. The digging here is much deeper than on the north side of the river, the pits going down in some cases 15 ft. It will consequently take a little time before everything can be laid bare. Wherever trial-pits were dug, foundations of some sort were come across, and these were not confined to places where walls showed above the surface, but were done generally over the whole area. We hope to say something further about these promising excavations in the course of a few weeks. Two students are at present looking after the works, which were set going by the Director in person about the middle of March. The school now numbers ten students, including two who are in Cyprus, where the excavations on the site of Salamis, which are being carried on under the auspices of the Cyprus Exploration Fund, are, according to latest accounts received here, likely to show important results.

The French School have commenced excavations on the site of Troezen in Argolis, opposite the island of Poros.

The usual winter course of architectural and topographical lectures given by Dr. Dörpfeld, the Director of the German School, in Athens and neighbourhood, has been somewhat interrupted this year through his absence for some time in Cyprus, where he went to look into questions connected with German excavation in the island. While there he took advantage of the opportunity to visit various places of archæological interest, —amongst others, the site of the former British diggings at Papho, and the works now in progress at Salamis. He has since gone to Troy with Dr. Schliemann, who is making further explorations there this spring.

A number of the fragments of the large temple statues found by the Greek Archæological Society last season during the course of their exploration of the site of the temple of Despœna at Lykosoura, in Arcadia, have been brought to Athens and stored in the Central Museum till arrangements can be made for bringing on the remainder, the present rough tracks being insufficient to transport some of the larger torsos. When these arrive the remains will be pieced together, and great hopes are entertained that almost the entire group, consisting of figures of Demeter and Kora with Artemis and Anytos, which, according to Pausanias, stood in this temple, will be recovered, and the Museum of Athens will then be enriched by the addition of a genuine temple-statue group of the fourth century B.C.

The very fine Byzantine mosaics in the church at Daphne, which suffered so much from an earthquake about the beginning of last year, have been temporarily secured till the arrival of a competent craftsman from Italy, who is shortly expected, and who, it is hoped, will be able to leave them in such a state as will ensure their stability for some time to come; but, while it is very important and necessary to thoroughly fix these, we trust that no attempt will be made to do anything in the way of restoration, which would utterly ruin their value as records of the finest period which have remained as they left the hands of their creator, and which, but for the injury they received from enraged and fanatic Turks during the time of the Greek Revolution, might have been preserved to us till to-day in an almost perfect state.

In three small rooms on the first floor of the offices of the Ecclesiastical Synod in Athens has been got together the nucleus of what promises to be a most interesting and valuable collection of Greek Christian antiquities. This small museum, which, we understand, is indebted for substantial help to Lord Bute, whose interest in Greek Christian remains is well known, was opened two or three weeks ago by the King and Queen of Greece. The collection embraces a general series of objects connected with the architecture and ritual of the Greek Church, and also includes a number of plans, drawings, and photographs of churches and of mosaics and frescoes, several old church service books, and some reproductions of illuminated manuscripts.

The architectural fragments consist principally of sculptured slabs, ceramic ornaments, fragments of mosaics and frescoes, portions of details of internal fittings such as the Iconostasis, &c., pieces of pavements and points of interesting constructional detail.

In connexion with ritual, we find a large number of vestments of various kinds, some being beautifully and richly embroidered, several crosiers, specimens of flagons, chalices and patens, many of them of pewter, rich altar-crosses of delicate silver filagree work, often inlaid or picked out with gold, and usually enclosing intricate and minute figure-subjects cut out of olive wood. We also find several bottles for holding the sacred oil, made of cast lead with ornamental borders and quaint figure panels, ceramic plaques for stamping the sacred bread, Christian hand and other lamps, and large flagons for storing the oil for these.

There are also many very carefully-taken stamped impressions of Christian inscriptions and of the flat, slightly-cut ornament which was so commonly used round the doors and in other parts of the churches; a number of old and interesting typical sacred pictures of Christ and the Virgin, and of saints and prophets, and a collection of about 800 Byzantine coins.

We hope shortly to give a more detailed account of this interesting series of objects, with perhaps a few sketches of the various types.

NOTES.

WE are still in the midst of an epidemic of strikes, and the subject engrosses the attention of a large section of the commercial and industrial community, having been discussed during the last few weeks at numerous meetings both of employers and employed. It appears highly probable that the Strikes Bill alluded to in our "Notes" of the 29th ult., will be quietly dropped. There could be no hope for such a measure unless the principle underlying it was acceptable to the majority of those concerned; and, so far from this being the case, it does not commend itself to either party. The element of compulsion in the Bill is condemned by all,—not excepting those responsible for it. Among the names appearing on the back of the Bill is that of Mr. Cremer, M.P.; and he has actually stated that he shall ask the hon. member who introduced it to withdraw it, and apologise to the House! The Trades Council term it "an unwise and astounding proposal," and earnestly entreat Parliament to reject it: while the Associated Chambers of Commerce simply ignore it as impracticable, and not worth consideration. They suggested the formation by the various Chambers of Boards of Conciliation, which would command the confidence of both parties, to arbitrate upon labour disputes; and invited the Trades Council to elect delegates to serve upon the Board. The latter, however, virtually decline to comply, although expressing themselves willing to assist to prevent conflicts. The result of most of the recent strikes has rendered workmen even more disinclined than before to submit to arbitration, under any name, and the proposals of the Chambers of Commerce were regarded with suspicion and designated "capitalist humbug." At the same time, they cannot go to the length of condemning the principle of conciliation, but they would only allow it to take the form of conferences between the parties to a dispute. This promises no improvement upon the existing unsatisfactory state of things, for the tone of recent Conferences of this nature has frequently been far from conciliatory. Indeed, it is impossible for the parties to a dispute to approach it with impartiality, though such conferences would serve to clear the way and narrow the issues. A practical but unprejudiced arbitrator, or Board of Arbitration, would then constitute the best and fairest mediator, and be far more likely to effect a speedy settlement of the dispute. In the absence, however, of permanent recognised "Courts of Appeal," there is always the danger of a dispute passing into the acute phase of a strike or lock-out before such a tribunal could be formed, or a suitable arbitrator selected.

THE academic labours of the Berlin congress came to a conclusion on March 29 with mutual congratulations to each other by the delegates and many expressions of gratitude to the Emperor of Germany for initiating the congress. We have called them "academic" labours because the very report of the delegates shows that the only force which can bring forth practical results is the national opinion of each separate European community. It is recommended that the States which may follow out the suggestions of the congress should "exchange the text of all legal measures adopted by them" with reference to the subjects before the congress. To pass legal measures it is necessary to have some popular force behind,—any changes, however small, will have to be discussed before popular audiences in this country,—whereas in Spain, where public opinion on such subjects as the labour of children in factories is not in so forward a condition as in this country, it is not likely that the recommendation of the congress will receive much

attention. A good deal of the proposed legislation has also been anticipated in this country, as, for instance, the prohibition of underground work for females. On the whole, the congress has been interesting rather as throwing light on the apparently benevolent autocracy of the young Emperor of Germany than for its practical usefulness.

THE whole archæological world will have heard with regret of the death of Mr. J. T. Wood, whose name will be connected for all time with the recovery of the remains of one of the most famous buildings of the world's history, and who it is to be feared impaired a naturally strong constitution and physique by his ardent labours at his chosen work under very great disadvantages from climate and circumstances. The melancholy part of it is that several years of these labours were, as we mentioned at the time of the appearance of his book on the Temple of Diana, unnecessarily wasted in hopeless search on the wrong side of the city; and that had he made due use of the information open to every one as to the probabilities of the site of the Temple, he might have achieved his object with far less waste of vital energy and in a much shorter space of time, and might have thus reserved health and time to publish the results of his labours in a form worthy of their importance. As it is, his best friends can only regret that he produced nothing but a popular book on the subject, an admirably-written and most interesting narrative, but not a monumental monograph of the type which archæologists had hoped to see from him, and which any German savant who had made such a discovery would certainly not have failed to give to the world, and which remains to be done, if at all, by other hands. However, the fact remains that he did discover what it had long been said could be discovered by any one who would seriously make the attempt, and that in the carrying out of his determination he exhibited a degree of energy and perseverance which is worth as much in its way as the highest archæological sagacity; leaving an example to others not to be discouraged by long delay and difficulties in prosecuting such a work, besides building himself an enduring name and place in the records of archæological enterprise.

ALTHOUGH apparently Captain Bötticher has not responded to Dr. Schliemann's invitation to meet him at Hissarlik and there discuss the question whether the remains are only, as Captain Bötticher asserted, those of a cemetery where the dead had been burned, Dr. Schliemann has produced a counterblast to the assertions of his critic by summoning a jury of experts and others to sit on the question and sign their names to a statement in French which was communicated to the *Times* of Tuesday. The list of signatories to the declaration, eight in number, includes the names of Professor Virchow and Dr. Waldstein, the former being probably included as being one of the best-known scientific men of the day, and one who was not likely to be easily taken in with respect to the weighing of evidence and the logical deductions to be made from it. Otherwise, Herr Virchow is not exactly an archæological expert, nor we presume is Mr. Calvert, the United States Consular Agent at the Hellespont. The others are M. Babin, Ingénieur des Ponts et Chaussées, and delegate of the Academy of Inscriptions and Belles Lettres of Paris; Dr. von Duhn, Professor of Archæological Literature at Heidelberg; Dr. Grempler, President of the Society of Antiquaries of Breslau; M. Hamdy, Director of the Imperial Museum at Constantinople; and Dr. Humann, Director of the Royal Prussian Museum. These gentlemen, the opinion of the majority of whom at all events should carry some weight on such a subject, have entirely dismissed Captain Bötticher's criticism, and certify that the remains are obviously those of a fortified town; that there is no sign anywhere of provision for the burning of human remains; that the ruins afford evidence of being composed of strata of débris belonging to successive periods, and that they found the foundations of Greco-Roman houses "dans la dernière couche," by which they mean, we presume, the upper stratum. They do not commit themselves to maintaining that Hissarlik is Troy, which could hardly be expected of them; but their evidence is, short of that, entirely in favour of the correctness of Dr. Schliemann's views as to the nature of his find; nor should we have expected otherwise. Whether the trouble which has been taken to secure this formal support is not impolitic in the sense of attaching too much importance to what was obviously a captious and sensational criticism, may be another question.

A PAMPHLET has been circulated by Mr. W. Saunders, member of the London County Council, consisting of "a statement of facts compiled from official sources" in regard to the question of Thames communication and the Blackwall Tunnel, and intended as putting a case in favour of a short tunnel and hydraulic lifts rather than a long tunnel and inclined approaches. He formulates the case briefly on the title-page as thus:—

Three tunnels with inclines... = £2,500,000
Time in crossing 40 minutes.
Two tunnels with lifts..... = £400,000
Time in crossing, 8 minutes.

We do not believe there will be such a difference in the times of crossing as is suggested here. We presume the figures refer in the first instance to the whole time occupied on the inclined roads at each approach as well as in the tunnel: but that is hardly a fair way to put it; and the eight minutes must be calculated on the assumption that the descent and crossing is commenced as soon as the vehicle arrives at the lift, which is certainly not likely to be the case always or even in the majority of instances: where one lift serves all crossers one way, it is inevitable that many must be kept waiting till the lift is fairly filled, and that even when there were a sufficient number of vehicles waiting to fill it at once, there must be time occupied in getting them into position. At the Mersey Tunnel the delay at the lift is very considerable, with foot passengers only. Apart from this, there is a great deal in Mr. Saunders's pamphlet that deserves serious consideration. The expenditure of horse-power in dragging up long inclines would mean a serious annual waste, besides the first cost both in actual operations and in purchase and compensation that would be entailed in making the sloping road approaches. Mr. Saunders states that Messrs. Armstrong estimated the annual cost of working lifts at the Tower-subway, for a traffic of 4,412 vehicles daily, at 4,000*l.* a year. Taking the traffic at Blackwall to amount to 2,500 vehicles daily, the cost of the lifts would not much exceed 2,500*l.* a year; a very small percentage certainly on the probable saving in first outlay, even if we regard Mr. Saunders's figures as somewhat too favourable (as they probably will prove to be) to his short tunnel theory.

WE have received the third annual report for 1889 of the Herkomer School of Art, Bushey. It appears to have attained a thoroughly sound and self-supporting position; the maximum number of students is seventy, formed into two main divisions, "preliminary students" and those attending the life class. Appended to the report is a reprint of Professor Herkomer's paper in a recent number of the *Universal Review*, "How we Teach at Bushey," in which he points out that the aim of his teaching is "the suppression of the art student" and "to coax out individuality," and to make successful work the aim of the student, and not praise or prizes. In these days of bustle and commonplace monotony of work, no objects could be more admirable. At the end of the report is a list of the present and past students who have during the past year exhibited works at the principal public galleries. We naturally turn to it to see the results of the six years' existence of the Herkomer School. The Royal Academy Exhibition comes first, and we receive a mild shock when we observe that the first picture which heads the list is entitled "Three to One On the Field" (oil)! Can this be the result of these high views, of this pure artistic life, of these pastoral plays on sunlit lawns; has the national sport even swallowed up this community too? A further perusal of the list does not raise our spirits. There is not one work which deals with the higher subjects of art; there are portraits, "Shiplake Backwater," "A Poacher's Bag," "On the Thames near Wargrave," and so on through the regular stereotyped subjects. What is the last? "Purple Clematis" (oil). "Far too many people dabble in art nowadays," says Professor Herkomer, in the above-mentioned paper: the works exhibited by the past and present students would, on the first appearance, seem to fortify this assertion.

THE Workmen's Exhibition which was opened on Saturday last at the Central Hall, under the auspices of the Working Men's Club and Institute Union, and which closed on Thursday last, was not very large or varied in extent, but in some respects it afforded a better display than is generally witnessed in such exhibitions. That this was so was mainly due to the fact that the amateur element, although quite sufficiently obtrusive, was more than counterbalanced by the exhibits which were the productions of workmen and workwomen in their own special trades and handicrafts. The majority of the exhibits showed good workmanship,—workmanship so good, in fact, that it was regrettable to see that the design of many of them was so poor. The trade which was most fully represented in the exhibition was cabinet-making; the building trades were very poorly represented. Among building trade exhibits we noticed some good specimens of plumbers' work by H. Goldman, a member of the Jewish Working Men's Club; and there were many good specimens of decorative work, as well as some bad examples. Among the curiosities of the exhibition we may mention what was apparently a very carefully-executed model of the South Hackney Club, made by Mr. C. Hamilton, a law clerk. The model was stated to consist of no fewer than 11,000 separate pieces of wood, each individual brick, seemingly, being represented by a separate piece of wood. The model is very cleverly executed, but, while commending Mr. Hamilton's industry and skill, we cannot but regret that so much time and ingenuity have been expended on making a model of what is a very commonplace brick house. Another thing that struck us, more, we must confess, on account of the exhibitor's name than on its own account, was "an imitation chess-table-top," as it is described in the catalogue: an "imitation-marble chess-table top" was what was meant to be described. It was apparently made of scagliola, in bright colours, and its exhibitor was "J. Ruskin," described as an "artist," and as a member of the United Radical Club. There are, it seems, two Ruskins in the field. We understand that this is the first exhibition of the kind held under the same auspices. The results have been so far encouraging, on the whole, but we shall look for improvement in future displays of the prowess of the "pick of the working classes" understood to be included in the membership of the workmen's clubs.

WE presume that the new hydraulic railway, at a gradient of 1 in 1½, which is to facilitate intercourse between Lynton and Lynmouth, is a practical convenience to people who are not strong enough to climb a hilly road, and it will probably also provide a merciful relief for many unfortunate horses from a weary pull up the hill; but it would be of some interest to know exactly what are the "devices" for stopping the cars and

averting danger in case of any accident to them or the machinery. A railway with such a gradient might be the scene of a very serious casualty, unless the provisions made against any chance of coming down with a run are thoroughly trustworthy.

A CORRESPONDENT draws our attention to the following interesting bit of "æsthetic" from *The Queen* of March 29. It is in reference to the works of an American lady sculptor, Miss Freeborn:—

"Sepulchral monuments have claimed her attention, in the first instance in memory of her own parents. It would be difficult to find anything more original or beautifully adapted to its purpose than this double memorial that represents two large columns, the one straight, the other spiral, intended to embody separately the idea of female grace and manly strength, blended by a spiral arch at the summit. While purely original, the spirit is Byzantine."

Which is the manly strength and which the female grace, the spiral or the straight, does not appear, nor does it appear to have occurred to the writer that columns are constructive features designed with reference to a superincumbent load, and therefore hardly suitable for separate and symbolic use. However, "spiral arch" is good.

A QUERY of Lord Bury's as to the need of a verb which should be applicable to the movements of an electrically-driven launch, as steam ("to steam so many knots") is applied, very irregularly and inelegantly, to the movement of a steamer, has drawn a number of letters in Thursday's *Times* making suggestions which are amusing at all events, if not very practical. The first correspondent suggests "to motor,"—"an electric-launch takes half an hour to motor from Mortlake to Putney,"—which would be the same as if we said that a boat driven by a steam-engine "took half-an-hour to engine" from the one place to the other. That is not happy. "R. W. S." is better with his suggestion to "mote," a verb properly formed from the same root as "motor," and already received into the language under the intensitive form "promote." This is ingenious and logical. Two correspondents suggest "electrize" and one "electrate." Too long, and not convenient words. Mr. Andrew W. Tuer distinguishes himself by the invention of a new cockneyism, and suggests that as Lord Bury wants a monosyllable, "to tric" will do to describe going in an electric launch: about as vulgar as "bus," and for the same reason most likely to be taken up. To "volt" will not do, if only because it is the same sound as "vault," and its formation into a verb of description is as absurd as it would be to apply to a steam-engine the word "to horse-power" from one place to another, because steam-power is roughly measured by horse-power. To "ohm" is worse, since, as another correspondent remarks, ohm is a measure of resistance, and therefore suggests the contrary idea to speed. We have no doubt that electric work must give rise to some new word-coinage, and we hope it will be made on better principles and in a less awkward manner than has been done so far, in the barbarous jargon of "ohm," "ampère," "volt," "watt," &c., which have no innate suitability of meaning, and which give to treatises on electricity the effect of being written in a foreign language. Meantime, in regard to the present query, we are in accordance with the Rector of St. Mary's, Colchester, (another contributor to the correspondence in question) in thinking that no new word is required at all, and that it is perfectly intelligible, as well as good English, to say that an electric launch "runs" from one place to another in a given time, and that her work may be described as "a fair day's run." We may observe that the use of "to steam" as a verb applied to the progress of a steamship is not only irregular but unnecessary, and is not in universal use; it is in fact a piece of newspaper reporter's phraseology, and not classical English.

THE MEDIÆVAL HOUSE.*

A GOOD example of an early house is Stokesay, near Shrewsbury.† It appears that the Hall was built some time in the thirteenth century, and that in 1291 the lord obtained a licence to crenellate, and built a tower. The buildings and courtyard are surrounded by a moat, 22 ft. wide, and are mostly of stone and in good preservation, but in some respects they depart from the customary arrangement. There is a gate-house. Opposite stands the house. It consists of a hall 51 ft. by 30 ft., with an open roof, and taceried windows which had glass in the tracery but shutters below. The hall has no fireplace. North of this is a room apparently intended for the cellar, with two rooms over, the upper one being of timber construction, and with a fireplace and good windows. The cellar and intermediate rooms have narrow windows (loops) intended for defence. At the other end of the hall is the solar—up steps, and with small rooms below it. Detached, but connected by a passage, is a tower of singular but picturesque shape. It was of three stories, and it seems probable, as there is a large fireplace in the ground-floor room, that that may have been the kitchen. The window openings in the tower all had shutters, and most of them had seats formed in the cills.

This may be taken as a good specimen of an English manor house as they were built about the time when the choir of Westminster was completed, and to which little has been since added. Much picturesque beauty it is true there is, the design of the windows, gables, buttresses, and open roof of the hall, most artistic and careful precautions against attack, but of comfort, convenience, privacy, warmth, and even shelter, very little indeed.

Stabling and other offices were in this instance, as in others, appended so as often to make three sides of a quadrangle.

The fifteenth century saw a great advance in the social condition of our ancestors, an advance which had begun in the century previous, and the Mediæval house was in that century accordingly much improved. A large number of noblemen and gentlemen had for country houses some sort of castle, and they had began, in the fourteenth century, in those cases where a stout tower or keep was standing by itself, to surround it with enclosed and fortified courtyards, within the shelter of whose walls rooms of various dimensions had been erected. This process was, in the fifteenth century, extended. The hall, whether in the castle or the manor house, ceased to be the common sleeping-place of retainers, and, by degrees, as manners and customs grew more refined, it ceased to be the dining-room of the lord and his family. Consequently more rooms, some of them for servants, others of larger size and higher finish for their masters, were added, and there were also not a few places which were required as stabling for horses, and occasionally for cattle and sheep. To the solar was often added a second large room. Of these two, one served as dining-room, while the other began to do duty as a ladies' withdrawing-room; and here we meet the dawn of our own invariable dining-room and drawing-room. A long room, called a gallery, begins to make its appearance in large houses. It was often hung with the family pictures, and hence probably our modern use of the word gallery to signify a place where pictures are collected. Sometimes, as at Hever, and, I think, at Penshurst, it is in the roofs; sometimes it seems to have been arranged at a lower level, in order that it might be used on state occasions *en suite* with the other principal living-rooms, as in the case of the magnificent gallery usually known as the ball-room at Haddon Hall.

Not infrequently a private chapel forms part of the construction of a large manor house, as it usually did of a castle. This is not usually large, but is often a graceful and well-contrived specimen of the architecture of the time.

At every period the architectural treatment of tracery, mouldings and carving with which we are familiar in churches, is paralleled by the treatment of the same parts in the domestic work. Vaulting, which is the finest, or almost the finest feature of church architecture, is, however, not largely employed in manor houses, though often in the more stoutly-built castles. On the other hand, the specially domestic features of fireplaces and chimneys, and the arrangement and treatment of the windows, so as to correspond to the many rooms of a mansion instead of the one space of a church, give a very different aspect to the Mediæval house from that of a church, and this difference is very much intensified by the constant presence of chimneys, and by the retention down to a late period of some of the features which the manor house borrowed from the fortifications of the castle,—as, for example, the tower, the turret-staircase, the battlemented parapet, the moat, and the protected entrance, with its drawbridge or portcullis.

To the interior of houses the art of the fifteenth century contributed a great deal that was eminently domestic in character; but, at the same time, rich and even sumptuous in quality. Carved and moulded woodwork in panelled dados and wall-linings, doors, staircases, and so forth; ornamental ironwork in fire-dogs, the latches of doors and windows, and other minor fittings. Ornamental lead-lights in windows, filled often with armorial bearings. Tapestry, and, as time wore on, stamped leather for lining the walls, and well-wrought plasterers' work for ceilings. These resources, together with painting, gilding, and colouring, were now all at the disposal of the architect of a country house, and what he was able to do with them now invites our attention a little in detail.

All that went to make up the Mediæval house is fortunately not of equal interest to us here, and there are many portions and features that we may well pass over, but upon one or two of them we should bestow a little attention.

First, the *fire*, and what it involved. The domestic hearth, much as the ancients made of it, cannot have been half so precious to them as to us and our forefathers in this chilly climate, probably worse in the Middle Ages than now. When there was only one room, whether it was a small house or a goodly hall, the fire in early days was, as has been remarked, at a hearth in the midst, and there was, of course, no chimney. In the hall-roof it was then common for there to be what is called a louvre,—that is to say, a kind of raised roof at the ridge of the general roof, and just over the hearth, with openings screened by what we still call louvre-boarding,—that is to say, boards some little distance apart placed on the slope like the laths of a venetian blind, so as partly to keep out rain, and yet to let smoke escape through the gaps between them. This feature is seldom left in halls that are in any way in use, as, if smoke is not going out of it, cold wind is apt to come in; but in the hall attached to the deanery at Westminster Abbey, already referred to, used as a refectory by the Westminster School, there is a louvre in the roof, very much in its original state, though the hearth has been replaced by a modern stove.

In smaller rooms, and before very long in halls, it began to be customary to have the fire at the side, and to carry the smoke up a chimney. It was very early an established custom, when a fire was to be provided for, to build a regular projection, often 10 ft. or so wide, and several feet deep, from the side of the room, to form a hearth in the middle of the space so gained, to throw a great beam across the opening between this hearth-place and the room, and gradually to contract the great space above and behind this beam into a chimney. Thus, there were two very warm, if, perchance, smoky snuggeries, created on each side of the hearth. These were the chimney-corners, or ingle-nooks. The fire was of wood, and there were iron bars at each side the hearth, called dogs, on which the logs could lie a few inches above the glowing ashes on the hearth. The front supports of these dogs were often richly ornamented with iron or brass work.

When the room was smaller, and especially in upper floors, the fire opening was smaller, and was constructed very much as we make them now, only that where we put a grate there was a hearth,—usually a little raised, with iron dogs.

The lintel over the openings of such fireplaces is generally not a timber beam, but a beautifully-constructed stone lintel, worked in many interlocking pieces. Sometimes it is an arch. These lintels and arches also frequently occur over fire openings of very wide space in Mediæval kitchens and halls.

When coal came into use, the iron grate to hold it followed as a matter of course, and the fireplaces became smaller, but substantially

* A lecture delivered by Professor Roger Smith at University College, London, as part of the Course of Archæology now being given there. (Concluded from p. 240, *ante*).

† Illustrations in Parker's "Dom. Arch.," Vol. I., p. 128.

though coal may have been used early in the North of England, the fires of the Middle Ages were wood fires, with their cheerful flame, ruddy glow, great heat, and pleasant smell; and the collecting, storing, and cutting of wood for fuel must have been one of the constant occupations of the household servants.

Next to the fireplace, perhaps the window is the part of a house that has most home-like character. No windows of any Mediæval house were like the sash-window of our day. It is a modern invention.

In early times, though glass was known and used for churches, the window-openings in houses were closed only by shutters. In the thirteenth century and down into the fourteenth we find domestic windows with tracery in the heads, the heads having been glazed, but the lower parts fitted with shutters, and the hinges and holes for the bolts and stone ledges for the shutters to close against show this clearly. If I am not mistaken, this was the case in some monastic buildings down to a later period.

When glass began to be obtainable, it was at first so scarce and costly that we are told that gentlemen in the Middle Ages used to carry their casement-windows with them from one house to another—and also, by the by, their tapestry hangings.

When glass became fairly plentiful,—which, we may assume, was in the fifteenth century,—the windows were made up of small pieces set in leadwork, often in the familiar diamond-shaped quarry, but not infrequently in more complex ornamental patterns, and these were secured usually to iron frames and bars let into the stonework of the window-opening. Such portions of the windows as opened (and they were not many) were hung as casements, and often fitted badly, and did not open far, but the latches and stays were usually charming specimens of ornamental ironwork. Of course, in timber-built houses the casements were of wood.

A feature which is of such frequent occurrence that its absence,—when it is absent from stone-built houses,—is a surprise, is the window-seat. The walls being mostly thick, there was plenty of room inside the window-sill to form a seat, which is frequently so fashioned that two persons could sit and face each other. At other times it is arranged,—as we mostly do it now when we employ it, bench-wise,—so that those who occupy it sit with their backs to the window. In all the Mediæval period it must be remembered that domestic windows were divided into comparatively narrow lights by upright bars of stone or timber, called mullions, and in the latter part of the time they were also frequently provided with one or more horizontal bars known as transoms. By this means, though the individual light was kept down to such dimensions that a leaded window was strong enough to fill it, it became possible to have wide and lofty windows, made up of many lights, when they were wanted.

The bay-window and oriel-window are features of the Mediæval house which added much to its beauty and also to its brightness. A bay window is a wide projecting window, sometimes square, sometimes half-octagon, and occasionally of other forms in plan, rising from the ground floor of the house.

It became usual, as has been already said, to introduce a bay-window into the hall. It was generally at the dais end of the apartment, and usually reached from floor to ceiling, often being of great size. In the Elizabethan mansions this feature was introduced into many other parts of the house (fifteenth century).

The oriel-window was a bay-window on an upper floor, only corbelled out, and consequently rarely so large as the bay. When the bay is introduced elsewhere than in the hall, it is very usual for it to be carried up through all the storeys of the house, and as the desire to make upper rooms pleasant increased bay-windows of this sort and oriel-windows came more and more into vogue.

You will probably turn next to the walls, and inquire in what manner they were finished. In early times,—and in less important rooms at all times,—they were plastered; but the Mediæval plastering was a very thin coating, not like the inch or inch-and-a-half which we at the present day heap on to our rough walls and then smooth down. When the inner face of the walls was not smooth the plastering did little to hide the roughness, and other methods were employed. I ought to add that this plastering seems to have been usually decorated by the painter, often being lined out in red, in imitation of masonry, or else painted upon with histories or fables.

As early as the thirteenth century, wainscoting, *i.e.*, lining walls with woodwork, began to come into use. It appears that Norway planks, *i.e.*, planks of fir, were imported into this country for this purpose, though most of our joinery was in oak. In later times the custom of so lining the walls of rooms to which it was desired to impart an air of comfort and finish became common. In the fifteenth century the curious ornament known as the linen-fold came into general use in the panelling, and towards the close of the century stamped leather began to be employed as a sumptuous wall-lining. The finest wall-covering, however, was the tapestry which was one of the glories of the Middle Ages, and may be said in Domestic work to have held a place something akin to that of stained glass in the churches and cathedrals.

As early as the twelfth century tapestry was occasionally in use, but it appears to have not been till far on in the thirteenth that it was often employed. The town of Arras became so celebrated for the production of tapestry that the Arras became the familiar name for it. In Shakespeare's Henry V., at the inconvenient moment when the search for the Gad's Hill robbers had become warm, you may remember the Prince says to Falstaff, "Go hide thee behind the Arras." Much good tapestry was produced in London, while Norwich became famous for worsted stuffs, while were used as a substitute for tapestry as a wall covering.

Tapestry was first employed to ornament the upper end of the hall, and gradually introduced into other parts of the house. It seems to have been usually so arranged as to take down and hang up from pegs or hooks so that it might be put away when not wanted or (as is stated to have been done) carried from the town house to the country one and back. I need not dwell on the capacity of this kind of material for serving as coloured decorations of the noblest sort.

It would be, I think, treason against the highest attributions of the study of archæology if in this lecture no word should be said on the group of buildings of which it takes cognizance viewed as works of art. When we endeavour to discern the special merits of their architecture, we, I think, must at once admit that they are singularly full of character. No buildings of any age or country are more happily successful in conveying to the spectator the impression that they are built for the purpose they were meant to serve. This is probably the first quality of good architecture; it is the one most commonly missed in imperfect modern work, and the complete attainment of it is the quality above all others which gives to the best ancient work its high value. Of such places as Ightham, Penshurst, Knole, or Haddon, your first impression is that they are dwellings: English, feudal, dignified, if you will, but, before anything else, domestic.

The next most prominent quality, especially of their exteriors, is picturesqueness. The accidents of situation, of varying requirements, and of subsequent alteration have provoked the most charming irregularities, and the most telling contrasts; and, so far as the interiors remain untouched, the same thing is there also true, though unfortunately nearly every Mediæval house that has been kept up has been dreadfully modernized, like Windsor or Alnwick; while almost every one that has not been kept up has been allowed to fall into ruinous decay. Few and far between are the Mediæval houses of which the hall and rooms have escaped one or other of these fates!

Tudor, Elizabethan, and Jacobean houses have been, in this respect, much more fortunate, and I am inclined to believe that a better general impression of what Mediæval interiors were at their best,—how artistic, how rich, and how varied,—would be derived from a visit to such a house as, for example, Audley End than from anything else. Time will not permit my saying anything about the furniture which went to create the artistic effect of those interiors, but it would be a subject worth your study, and in case you care to see a splendid series of copies of old decorations and furniture, I ought to add that the late Emperor of the French, with all the resources of the most artistic nation of modern Europe at his command, strove to restore the magnificent county Château of Pierrefonds, near Compiegne, to a condition of completeness, inside and out, including its furniture. He had the advantage of the learning of Viollet-le-Duc. The old walls were almost, if not quite, perfect when the work was begun, but all else is the creation of the great archæologist. I believe it has probably been overdone, but to those who are interested in Mediæval domestic art I recommend a visit to Pierrefonds as an archæological lesson worth taking.

I propose now to invite you to accompany me on an imaginary visit to one Mediæval house, in many respects the best for our purpose which England affords, and of which, fortunately, excellent photographic illustrations have been provided by Mr. Brooks. I allude to Haddon Hall, in Derbyshire.

Haddon Hall* is the property of the Duke of Rutland. How it came to them, and what have been its fortunes since Doomsday, in which survey the place is named, is very pleasantly told in the article in the current number of the "Quarterly Review," from the pen, as it is said, of the present Duchess of Rutland. The hall has not been occupied since the year 1700, and no alterations and modernisations have been introduced since that date, and though it has been robbed of much of its furniture, whatever remains is appropriate. There is much good tapestry, and the fabric has been constantly looked after, and is not allowed to fall into decay.

It is erected entirely with stone-walling strongly built, but very picturesque, and is a house of very considerable extent, quite fit for a nobleman's seat.

Haddon has no mote. It stands on a projecting crag or spur of no great height, thrown forward from the rising ground that forms the west boundary of the valley of the Wye, and the stream washes part of the foot of the rock, but can never have formed a substitute for a mote, and though walled it never was a castle, only a strongly-built manor house. Haddon was built and altered at several times during the Mediæval period, and part of the place was built or rebuilt in Elizabeth's time, and a little internal fitting was done to a few rooms at a rather later date still. I propose, however, that for our present purpose we accept it entire as an example of the Mediæval house.

The block of buildings is a parallelogram of slightly broken outline, and there are two internal, somewhat irregular, quadrangles. The entrance front faces due north; the garden front is south; and the quadrangles are east and west. The hall, with its butteries and kitchen at its north end, and its solar and upper withdrawing room, at its south end, forms the middle block, and extends across the whole building from north to south, and so has a quadrangle on either side. Each quadrangle is separately entered, and each entrance is under a tower, the two towers forming the ends of the north front. The Eagle Tower, the north-east one, is the earliest, and appears to have been built in the thirteenth century. The Entrance Tower, chiefly made use of, is at the north-west angle, and forms a commanding feature. It is of much later date, being, as we see it, probably part of the work of Sir George Vernon, known as the King of the Peak, who held Haddon from 1515 to 1565.

The chapel, one of the oldest parts of the building, is at the south-west corner. It and the hall, the solar, and the kitchen are the only important parts of the building on the ground floor; the other rooms, for family occupation or state, are on the first floor; and under them, on the ground level, are offices or very inferior rooms, and in some cases no rooms at all. The general disposition of the first-floor rooms may be described as follows:—There is a range of rooms, formerly used as family living rooms and bedrooms, in the north range of buildings and part of the west. There are three such rooms also on the south range at its west end. Over the solar (or dining-room) there is a drawing-room. The whole of the remainder of the south wing is occupied by the gallery, often called the ball-room, 109 ft. 6 in. long and 18 ft. wide, exclusive of the bays. The east range of buildings is mainly occupied by the great state bedroom, and the two ante-rooms belonging to it.

Thus we have the normal arrangement of the hall, with all its usual appendages, forming the heart of the house, and added on to it the various ranges of buildings which were necessary to make Haddon a lordly mansion.

* The plan of Haddon Hall occurs in Parker's "Domestic Architecture," vol. iii., p. 97, also in the *Quarterly Review* for January, 1890, and is given with many other illustrations in Mr. Jewitt's guide to Haddon Hall. For a careful account of the architecture of the Hall see a paper by Prof. Roger Smith in the *Builder* for May 15, 1880, with illustrations.

Sarcophagi recently discovered at Rome.

The hall is entered by a porch which gives access to a passage cut off by an oak screen with two arched door-openings. At the higher end of the hall there is a dais or platform raised one step, on which still stands the massive oak table and bench. In the middle of one side is a wide fireplace, and there are windows with pointed heads and fourteenth-century tracery, but there is no bay. Unfortunately the original roof has perished. It, of course, was an open one, but as there is a regular chimney it probably had no louvre. Over the passage already alluded to as cut off by the screen is a minstrels' gallery.

At the south end of this room up some steps is a fine parlour with woodwork of the time of Henry VIII. This is the solar, and over it is a drawing-room—part of the Elizabethan additions.

The finest Elizabethan feature is, however, the noble ball-room with three vast bays, its walls lined with wainscotting, its ceiling a beautiful specimen of ornamental plastering, and its extensive floor of oak furnished, it is said, by a single tree.

SARCOPHAGI RECENTLY DISCOVERED AT ROME.

OUTSIDE the Porta S. Lorenzo, the engineer Cantoni, making some excavations for the foundation of a new house, discovered, a few weeks since, two interesting Roman sarcophagi, of marble, of which we give illustrations, reproduced from photographs. The first, of rectangular form, is covered in the front with sculpture in high relief, representing the story of Medea. The style of art is that of the second century after Christ.

The second sarcophagus, very interesting for its ornamental motive, exhibits, in the centre, a group of the Graces, and above this is a bust (probably a portrait of the deceased person) in a medallion. The remainder of the surface is treated with an undulated fluting. On the ends were sculptured decorative lions' heads, of which only one remains in position.

This sarcophagus, according to the character and coiffure of the bust, may probably be referred to the time of Alexander Severus (222–235 A.D.).

L. B.

A COMPULSORY EXAMINATION FOR ARCHITECTS.

SIR,—The members of the Royal Institute of British Architects are now being asked to vote on this momentous question: "Whether it be expedient or not to at once close, if they can, the hitherto open profession of architecture."

It seems to me an opportune moment for the whole profession to give this question a full and impartial consideration.

I think such a devotion towards architecture animates the whole body of the profession, from the humblest to the highest, that the body would not hesitate for a moment to sacrifice the present good of the architects for the good of the art, did such an antagonism exist. At the same time, I think it is possible that some important considerations may be overlooked when an immediate answer is called for.

As I take it, the question to be solved is this: Will a compulsory examination of all, who shall hereafter be allowed to practise the profession, really promote greater excellence in the art? If a compulsory examination becomes law, the efforts of the students must be directed to fitting themselves to pass it. Can any examination be devised that will really aid men of genius in becoming better architects? For I hold it to be of infinitely greater importance that the few great men should not be hampered in the attainment of the requisite knowledge and skill, than that the bulk of architects should be a little better, and that absolutely ignorant impostors should be excluded.

If the examination be slight it is illusory, and if severe it comes under Mark Pattison's description that, by another turn of the examination screw, not only is more useless torture inflicted, but all independent thought is crushed out.

If we knew how the great architects of the great fine art epochs had been trained we should have some safe ground-work to build on, but on this subject we are in the profoundest ignorance. Some believe the Greek architects were sculptors, but if so, what was their subsequent training? We do not even know how the Roman architects were trained, though we believe that most of them were Greeks. We know nothing of how the Byzantine architects were trained, though Procopius states that Anthemius of Tralles was a great mathematician.

We read in the "Arabian Nights" that when great buildings were to be erected the "geometers and mathematicians" were called in. In the dark ages and in the early Middle ages the architects are called "stone-cutters." We learn from Viollet-le-Duc that there were schools of architecture in some monasteries, and that in the thirteenth century architecture fell into the hands of laymen, but the "Bons" who built the Ducal Palace, the Porta della Carta, and refronted the Ca d'Oro at Venice were called "stone-cutters." Lombardo contracted for a certain sum to build and carve Santa Maria dei Miracoli, according to a model he had made. Baldassare Longhena kept a mason's shop to the end of his life.

Brunelleschi was a goldsmith and sculptor before he domed the Cathedral of Florence, and he learned how to do it by studying Roman vaulting and making models. Most, if not all, the Italian architects of the Early Renaissance were brought up as goldsmiths, and became painters or sculptors before they became architects, and their main architectural study was measuring Roman ruins. We know that Bramante, Baldassare Peruzzi, and Vignola were painters, that Fra Jocondo was a monk and a scholar, and that Sansovino was a sculptor. Bernini was first a sculptor, then a painter, and then an architect. Inigo Jones was a landscape painter, and became a pupil of Palladio; Wren was a universal philosopher—he was a demonstrator of anatomy and a lecturer on astronomy as well as an architect. Perrault was originally a doctor, Alfieri a barrister. What was Sir John Vanbrugh besides a playwright? how did he acquire his architectural skill? though we know he was for some time clerk-of-the-works to Wren. Were Gibbs, R. Adam, Sir W. Chambers, and Wilkins brought up as architects, in our sense of the word?

We might possibly learn how the Persian architects are trained, and the native architects of India, for no matter how skilful our architects may be who go there, most of them soon adopt Persian or Indian styles.

Let us suppose that a love for architecture should arise, and the public begin to have a taste in some definite direction, can we now say from what class the architects would arise who would put that taste into shape? Would they arise from the carpenters, bricklayers, masons, or plasterers, from the engineers or ornamentalists, from the architects, or from a class that has nothing to do with the constructive professions or trades?

Some years ago the Royal Institute of

British Architects settled that in future no person should become a professional member of its body who could not show by examination that he had an acquaintance with the main elements of the profession, or could prove it by the works he had erected; but beyond this the candidate has to show that he has passed some sort of apprenticeship to the profession. It cannot be denied that this examination has given an impetus to the students to study the subjects included in it. No one knows, however, how it will eventually succeed, as it has not been tried long enough, and the system, too, has just been changed; nor can any one say that the success achieved is wholly due to this examination, and not to other concurrent circumstances.

The professional sense of the word "architect" is a person who, besides planning conveniently, building soundly and healthfully, can add a certain amount of beauty to the structure.

The bulk of the public probably take it to mean anyone from whose drawings any building has been erected or altered.

Suppose the votes in favour of closing the profession preponderate, and that every future architect must pass a legal examination to be allowed to practise; can it for a moment be supposed that the Legislature will insist on a fine-art test? The material good of the public is certainly all that will be legislated for,—unless, indeed, a change has come over its views, and it will require an examination to be passed before a man can practise as a painter, sculptor, musician, actor, or author. Will the Legislature break at once with Adam Smith and the philosophers of the last century, and insist on apprenticeship or any other test but the examination in construction and sanitation? Every person of legal age who can pass this will be allowed the title of architect, and permission to practise. Every tradesman, too, who has had "Architect" painted on his shop before the passing of the Act, or who has furnished drawings for a building erected or altered, will be an architect by Act of Parliament.

As to the effect of the examination, if it be slight, as at present, it will not present grave obstacles to those whose strength lies in æsthetic design, provided they have had a good education, but make it severe, and it will exclude a vast proportion of æsthetic talent.

I am told that in Austria, where the constructive examination is severe, it excludes many of the artistic architects, so that the certificated engineering architect has to keep as a partner an uncertificated architectural designer.

It was from this point of view that Professors Cockerell and Street deprecated a compulsory examination, both of whom put this question to the Institute, "Are we so overwhelmed with artistic talent that we can afford to exclude any of it?"

I may add that Professor Huxley published a paper deprecating the compulsory examination for doctors. G. AITCHISON.

ATHENS: ITS MYTHOLOGY AND ART.

BEFORE proceeding with her examination of the Athenian cults, Miss Harrisen devoted the whole of her sixth lecture to a sketch of the topography of Athens, following in her exposition the views of Dr. Dörpfeld. The chief points to be noted are:—The ancient district of the *Limnai* (Marshes), so long thought of as south of the Akropolis, is now placed just by the Dipylon Gate. Here Pausanias (I. 2, 5), soon after he enters the city, sees a precinct sacred to Dionysos,—here would naturally be the god's older worship, first established on his entrance into Athens. Later, this cult in the Limnai was thrown into the shade by the more important theatre and temples south-east of the Akropolis. This Limnai district was watered by the newly rediscovered Eridanos (*Builder*, March 1). About here lay the Kerameikos, or potter's quarter, and the commercial *agora* or market-place, commanded by the Kolonos Agoraios (market-hill) on which was a temple of Hephaistos (long misnamed "Thescion"), patron of potters and all artizans. Slightly to the north of this temple may be placed the shrine of Aphrodite Ourania. (A beautiful type of this, the heavenly Aphrodite, may be seen on the matchless plate from Kameiros, in the British Museum,—it shows Aphrodite passing through the air on a swan.) Below the eastern slope of the Kolonos Agoraios were the various famous *Stoai* (Basileios, Eleutherios, &c.), and the temple of Apollo Patroos, noted by Pausanias on his progress south towards the Areopagos. Under the north slope of the latter hill was the *Metroon*, or shrine of the mother of gods, within whose sacred precinct were enclosed the *Bouleuterion* or Council Chamber, and the *Tholos*, or dining-place of the Prytanes (Paus. I., 3, 5). Above the Metroon under the north-western brow of the Areopagos were the statues of the Eponymous heroes of the Attic tribes. Opposite these, on the other side of a road leading to the Akropolis, were the famous statues of the tyrant-slayers, Harmodios and Aristogeiton, by Kritias and Nesiotes. The *Agora* proper,—the ancient political agora, not to be confounded with the commercial market-place mentioned above,—occupied, Miss Harrison maintains, the ground between the Areopagos, Pnyx, and Akropolis. Here, about the south-west angle of the Areopagos, was the celebrated *Enneakrounos* fountain, of which Dr. Dörpfeld believes he has discovered the channels. Next was the sacred enclosure of the Eleusinian deities (*Builder*, March 1). South of the Agora, near the *Pelasgikon* was the temple of Aphrodite *Pandemos* (of the people). This new explanation of the topography of Athens makes the long-discussed route of the Panathenaic procession quite clear. Starting from the *Dipylon*, it passed through the *Limnai*, then east of the *Kolonos Agoraios*, down the road between the *Areopagos* and *Pnyx*, passed through the *Agora*, skirting the *Eleusinion*, and so went up to the *Akropolis*. The district south of the Akropolis, stretching to the Ilissos, where the Athenians of the fifth century had their dwelling-houses, was shown to have been built on at a much later date than the whole western region. In resuming her exposition of cults with that of Dionysos, the lecturer showed his intimate connexion with the Eleusinian deities. The theatre of Dionysos, the old *orchestra*, or round dancing-place, the *choros*, and the mimetic character of Greek choros dancing, had all been discussed in the autumn of 1888, and Miss Harrison seems to abide by the views then expressed. In returning to the Akropolis, an interesting analysis was given of the old and rather dim cult of *Zeus Polieus*, guardian of the city, who guarded it in the days of Kekrops, before ever Athene came, and contested for the lordship of the land with Poseidon. Zeus, too, was the original lord of the olive-tree, afterwards the special token of Athene. Sophokles keeps up this tradition for us in the fifth century, when in the chorus of the Oedipus at Colonus he says of the olive: "Youth shall not mar it, . . . for the sleepless eye of the Morian Zeus beholds it." The lectures ended with an examination of the sculptures of the Parthenon. It is interesting to note that Miss Harrison holds the view which seems, slowly but surely, to be gaining ground among archæologists, to the effect that in the Eastern pediment of the Parthenon the birth of Athene was represented realistically, *i.e.*, the goddess was springing, fully-armed from the head of her father, in the old Athene Polias type, in striding motion, with shield and spear. This supposed scheme is echoed for us in many vase-paintings. It would have the double advantage of giving us the *actual* moment of the birth, so important in a temple of the goddess, whereas all other schemes have given vague and undefined moments, and the small figure of the goddess would admirably fill up the angle at the apex of the pediment towards which drive all the lines of the composition, architectural and sculptural. For the Western pediment, the lecturer, in accordance with a theory of Mr. Cecil Smith, of the British Museum, thinks the exact moment represented was that in which the two deities, Athene and Poseidon, move aside to show their tokens—the great olive-tree and the well of salt-water. These tokens would occupy the centre of the pediment, and from the top branches of the olive-tree would perhaps float down a little Nike to crown Athene,—such a figure would well correspond to the new-born Athene of the Eastern pediment. This new conception, instead of the old one of strife, when Poseidon with his trident was looked upon as attacking the olive-tree, gives great dignity to the composition—the gods, after striking the earth with their respective weapons, are moving aside in corresponding attitude to left and right, to show their great gifts to the land.

Within the temple, the great ivory and gold statue of Athene Parthenos, by Pheidias, was the embodiment of the best thought of Athens, religious and political, and was, moreover, the highest artistic expression of the most sacred type of Athene; for the Parthenos is merely the old fighting Polias softened down to suit a time of triumph and of peace; with the religious myths most dear to the Attic race serving as rich designs for her pedestal, her sandals, or her shield,—with all the great attributes of the city grouped about her, the snake, the Victory, and, doubtless, the olive, she might well let spear and shield sink to the ground in rest; she needs them no longer in the strife, but only as emblems of power, for the Athens of the age of Perikles is a victorious Athens; and Athena, conqueror herself in her great ritual, to the exclusion or absorption of all other gods, stands there in the famous temple as the sole protector and guardian of the city:—

"Pallas, our lady of Athens."

The lectures have been admirably organised by Mr. R. G. Tatton, secretary of the Chelsea centre for the Extension of University Teaching. The audience has been very large, and regular in attendance. At the close of the last lecture a vote of thanks to Miss Harrison was moved by Mr. Ernest Myers, in the name of the Council for the University Extension.

THE EXAMINATION IN ARCHITECTURE, MARCH, 1890.

AT the Examination to qualify for candidature as Associate, held in London during the week commencing the 24th ult., fifty-three gentlemen out of fifty-six admitted by the Board of Examiners presented themselves. Of these, twenty-one have been relegated to their studies for one year, and six have not passed. The names of the twenty-six gentlemen who have passed are:—

Anscombe, A. E.	Hill, H. L.
Beckett, R. T.	Howard, E. P.
Bedford, F. W.	Hughes, H. H.
Carter, E.	Mettam, W. J.
Eaton, W.	Nunn, B. W.
Eccles, T. E.	Russell, S. Bridgman.
Frere, E. C.	Scott, J. D.
Gibson, J. S.	Spackman, A. E.
Goodwin, W. B.	Webb, W. A.
Habershon, A. E.	Wood, H. S.
Hart, A. H.	Woodington, H. A.
Harvey, G.	Worthington, P. S.
Heron, A. H.	Young, E. A.

The oral examination of the fifty-three gentlemen who presented themselves, which was conducted by the Board of Examiners in Architecture, commenced at 10 a.m. on Friday, 28th ult., and terminated at 7.30 p.m. on the following day. No Qualifying Examination was held this March by the Allied Societies.

THE PRELIMINARY EXAMINATION,* MARCH 1890.

Seventy candidates were admitted to the Second Preliminary Examination, of whom eighteen have been declared exempt. Of the remaining fifty-two candidates, eighteen have been relegated to their studies until next November, and thirty-four have passed. Of the latter, twenty-two were examined in London, five in Bristol, and seven in Manchester. The names and addresses of the fifty-two passed candidates, which have been entered on the Register of Probationers, are here given, that is to say:—

Austin, C. A.	King, A. S.
Bailey, H.	Lawrence, G. C.
Beckett, J. H.	Leslie, H. G.
Bishop, T. H.	Ligertwood, G.
Booth, H.	Longworth, W. H.
Brown, W. G.	Lucas, T. G.
Bulman, H. G.	Lynam, T. R.
Carré, H. B.	Marchant, R.
Cox, H. J.	Middleton, C.
Delves, S. W. W.	Morton, R. H.
Finch, W. H.	Nicholson, E.
Fraser, G. W.	Pearce, R. L.
Galt, W.	Pearson, H. L. D.
Goldie, C. R.	Price, F. J.
Goodwin, W. D.	Rochester, C. D.
Gullan, H. F.	Savage, R.
Harris, S. S.	Scrivener, H. M.
Harrison, J. E.	Simpson, G. M.
Haywood, G. W.	Simpson, W. H.
Hennell, A. R.	Sterry, H. E.
Hicks, F. G.	Stratton, A. J.
Homfrey, H.	Streatfeild, G. E. S.
Hunt, J.	Watkins, W. G.
Hunter, R. H.	Ware, E. F.
Johnson, H. W.	Wells, W. W.
Jones, W. S.	Whitmore, S. W.

* To qualify for registration as Probationer.

OBITUARY.

Mr. J. T. Wood, F.S.A.—We announce with much regret the death of Mr. John Turtle Wood, F.S.A., Hon. Fellow of the Royal Institute of British Architects. Mr. Wyatt Papworth contributes to the *R.I.B.A. Journal* for April 3 the following appreciative notice:—"In the Annual Report of the Institute, read May 3, 1875, reference was made to the election in 1874 of Mr. J. T. Wood as a Fellow, 'whose antiquarian researches at Ephesus have won for him an European reputation, and whose valuable services in rescuing from oblivion the site and remains of the famous Temple of Diana, have been deservedly recognised by Her Majesty's Government.' To-day it has to be announced that Mr. Wood died on the 25th ult. at Worthing, of heart disease, in his 70th year. He had been advised in January to reside for a time at the seaside to escape the London fogs, and had hoped to return to town this month. Having been away from England for so many years, there are few probably who knew much of Wood; my acquaintance, however, dates from about 1846, in connection with his making a plan of part of St. Martin's parish, at which time his office was near Somerset House. He was born February 13, 1821, in London, and studied at Cambridge under a tutor. His master's name is unknown to me, but I think he was in the office of Mr. H. E. Kendall. In 1850 he was at Venice. In 1853 he married, and practised in Victoria-square, Grosvenor-place, as an architect. In the early part of 1858 he accepted the appointment of architect to the Smyrna and Aidin Railway, and went out there in April to design the stations on that line. He commenced the first excavations at Ephesus in May, 1863, exploring the Odeum and the great Theatre. Whilst so engaged in April, 1865, the place was visited by the Duke of Connaught, and Mr. Wood accompanied him to Mitylene, Pergamos, and Assos. After spending his own money on the work for two years, he commenced his search for the Temple in 1867, under the auspices of the Trustees of the British Museum, who forwarded to him a small sum. With a larger grant, and after six years of toil, just at a moment of despair, he fortunately hit upon a corner of a thick wall of large stones, which proved to be the Peribolus wall built by Augustus. A sufficient sum was then granted to complete the discovery of the Temple itself, which was effected in May, 1869. He then returned to England, and, in July, 1871, read a Paper at the Society for the Encouragement of the Fine Arts,* when he gave an account of the discovery, and stated that the first clue which led to the finding of the Temple was an inscription, unearthed by him at the great Theatre, particularising the circuit of the city to be made by the priests of the temple in their sacred processions, and specifying a certain Gate. This Gate he found about May, 1868, and choosing the most worn of two roads, he opened it up; then, following a road branching towards the open country, he at last came upon this Peribolus wall. Trial holes showed a white marble pavement and remains of large columns with their capitals and bases. Wood afterwards resumed the excavations. Then came the discovery of buildings connected with the Temple from 12 to 20 ft. deep; mosaic pavements and inscriptions; the pavement and other remains of the Temple itself; the discovery of columns *in situ*, and many fragments. The site of about eight acres was then purchased. Some coins, portions of a large sculptured frieze, and of a sculptured drum of the *columna celata* of Pliny, were obtained. These occupied the time up to April, 1872. Probably Wood was again in London pressing for money, for I find that in July the Institute, with other societies, had considered the question of the continuance of the excavations, as shown by the President's Address of November 4, 1872. The public press now began to take an interest in the discoveries. In the *Builder* of February 10, 1872, vol. xxx. p. 106, appears the first illustration, a plan and part of a column, and, p. 726, a drum of one of the sculptured columns. In 1873 Mr. Wood forwarded a plan of the Temple, with a letter dated January 18,† describing his researches and conclusions; for explorations on the site were continued from season to season to 30 ft. beyond the lowest step of the platform on which the last step had been raised.* More of the great sculptured frieze, of the sculptured columns, and of architectural detail, were discovered. The plan of the Temple was gradually developed; discovery was made of the distinct remains of three temples of Diana on the same site, and of the evident use of gold and colour in the building. The excavations were finally abandoned in the spring of 1874. The pit dug out was 500 ft. long, 300 ft. wide, and 22 ft. deep. All this cost about 12,000*l.*; the total amount expended from first to last was 16,000*l.*† Wood then returned to London, and in January and February of 1875 he gave a course of four lectures at the Royal Institution of Great Britain, 'On the Discovery of the Temple of Diana, and other results of the Government Excavations at Ephesus.' In 1875, February 15, Mr. Wood read a Paper at the Institute, 'On the Temple of Diana at Ephesus.' After its perusal, a resolution was passed 'to consider the propriety of memorialising her Majesty's Government with a view of soliciting its substantial aid towards continuing the researches at Ephesus, &c.,'‡ and on March 1, 1875, it was announced that her Majesty's Government had recommended Mr. John T. Wood for a pension of 200*l.* a year, in recognition of the valuable services which he had rendered by his exploration and discoveries at Ephesus. He had been employed on this work for thirty-six months out of five years. When out of these five years are taken the periods devoted to fever and other circumstances trenching upon a considerable part of the thirty-six months, and that he had to work below the surface some 20 ft. down to the ancient water-bed, and to contend, not only with miasma and fever, but with many obstacles and privations, it is fortunate he has discovered as much, and so much of a remarkable character. In 1877 Wood published his well-known work, 'Discoveries at Ephesus, including the Site and Remains of the Great Temple,' in octavo, with numerous illustrations.§ As was said of it at the time, 'No one will read this book without a lively interest in its graphic descriptions, and a feeling of respect and admiration for the indomitable perseverance of the author, and for the healthy, manly, unaffected tone which pervades his narrative.' Moreover, in it he refers to the valuable assistance he and his labourers experienced from the care and attention bestowed upon them by Mrs. Wood. At the Society of Biblical Archæology, on February 5, 1878, he read a Paper 'On the Antiquities of Ephesus having relation to Christianity, the Sojourn of St. Paul in that City, the Tomb of St. Luke,' &c. In this year he resigned his membership of the Institute, and thereupon was elected an Honorary Fellow. In July, 1882, finding that Government would not aid in further excavations, his friends obtained permission to hold a meeting at the Mansion House to promote the resumption of the work. It was expressed that 12,000*l.* spent on the previous labours was nothing to the amount expended by the Germans at Olympia. A public subscription was proposed. Another meeting was held at the South Kensington Museum.‖ A sum, moderate in amount, was raised, and with it he worked at Ephesus. In June, 1883, Mr. Ferguson, having read a Paper at the Institute, 'The Temple of Diana at Ephesus, with especial reference to Mr. Wood's discoveries of its remains,' he replied to it by one on June 9, 1884. Both papers are in our 'Transactions.' Towards the end of 1884 he wrote for the *Builder*¶ an 'Account of the early works, and of the excavations carried on by the private subscriptions,' which had been raised under a committee, from March, 1883, to February, 1884, by which he was enabled to explore the portico surrounding the Temple area; and giving his modifications of his plan. A fund was proposed for further works, Sir John Lubbock being the hon. treasurer.** Last year Wood lost his son, his only child, by fever, while practising as a civil engineer in Spain, which appeared to his friends to tell upon his health, and may have hastened his decease."

Mr. Ernest C. Ayton-Lee.—We also regret to have to record the death, on the 29th ult., of Mr. Ernest Claude Ayton-Lee, better known by his old name of Ernest C. Lee, at the early age of forty-four. Mr. Lacy W. Ridge, writing of him in the *R.I.B.A. Journal*, says:—"Among the students of a generation who have now passed well into middle life, he was conspicuous for his ability and originality as designer and draughtsman. He gained both the Pugin Travelling Studentship and the Soane Medallion in 1870. When the Gothic revival was at the top of its tide, he came under the influence of William Burges; and, like him, brought great care, genuine enthusiasm, and a quaint power of design to bear on the study and development of architectural detail and ornament. The studies which he earnestly pursued himself he endeavoured to commend to others, and he was among the first promoters of the 'Architectural Association Sketch-book,' and almost the founder of the Colour-decoration Class. He became in turn President of the Class of Design, and ultimately of the Association itself. The influence given by this position he used to promote the welfare of the Architects' Benevolent Society. He built, and rebuilt after fire, the parish Church of Whitechapel. He erected churches at Brentwood and elsewhere; also Berechurch Hall, near Colchester, for his uncle, Mr. O. E. Coope, the late member for Middlesex, as well as many other works. A professional career so well begun was not destined to be long. He was elected an Associate of the Institute in 1869 and a Fellow in 1881. Ill-health necessitated retirement to the bracing air of Ramsgate, and to-day 'Goths' and 'Picts' mourn the loss of a talented professional brother and a genial friend." From another source we learn that Mr. Lee was born on April 17, 1845. In 1864 he was articled to Mr. R. W. Edis. In 1869 he gained the Soane Medallion for a design for a railway station. In 1870 he was elected Pugin Travelling Student. In 1880-81 he was President of the Architectural Association. It was mainly due to his exertions that the A. A. Travelling Studentship was established. Later on he was instrumental in securing the gift of a silver medal by the R.I.B.A. to all Pugin Students. He was one of the five successful competitors in the first (open) competition for the new Dublin Museum buildings. The following buildings were erected from his designs and under his superintendence, viz.:—Church of St. Thomas, Brentwood, Essex; Church of St. Paul, Bentley, Essex; Church of St. Mary, Whitechapel (two churches, the first of which was destroyed by fire in 1880); Church at Collier Row, Romford, Essex; and a church at West Greenwich. He restored the Church of St. Andrew, Hornchurch, Essex; and the Churches at Dagenham, Essex, and St. Mary, Ilford, in the same county. Among his miscellaneous works are the following:—St. Matthew's Mission House, Westminster; schools at Barrow-in-Furness (in conjunction with Mr. H. Curzon); schools at Brentwood, Essex; bank at Colchester, for Messrs. Round & Green; Berechurch Hall, for the late Mr. O. E. Coope, M.P.; Gower's-walk Free Schools, Whitechapel; The Grange and cottages at South Weald, Essex; houses at Redbrook-park and Maida-vale; vicarage at Bentley, Essex; vicarage at Horsell, near Woking; house at Bentley, for Mr. E. W. Matthews; houses at Brentwood, for Captain Cole; and houses at Shere, Surrey. In 1887 he added his original family name of "Ayton" to that of "Lee." His remains are interred in Teddington Cemetery.

The Rev. Prebendary Scarth, F.S.A.—The death is announced of the Rev. Prebendary Scarth, F.S.A. He died at Tangier on the 5th inst., whither he had gone for the benefit of his health. He was in his seventy-sixth year. Mr. Scarth was one of the oldest beneficed clergymen in his diocese, having entered it so far back as 1841, when he was presented by the Duke of Cleveland to the important living of Bathwick. Here he laboured for thirty years. In 1871 he retired to Wrington, hoping in the greater ease and tranquillity of a rural parish to devote more time to those antiquarian studies and researches in which he took such delight, and which had brought him not simply national, but European fame. His genial manner and his great knowledge of Roman antiquities rendered him a welcome visitor at archæological congresses. His death will be deeply regretted by all who knew him.

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* Reported in the *Builder*, vol. xxix. pp. 580, 610.
† *Athenæum*, March 8, 1873.

* *Builder*, 1874, vol. xxxii. p. 100.
† Sir C. Newton gave a lecture in 1874 on the discoveries.
‡ R.I.B.A. Annual Report, 1875.
§ Reviewed in the *Builder*, vol. xxxv. p. 171. Many views of Ephesus were taken, and published 1876, with a catalogue edited by the late Mr. R. P. Pullan.
‖ The *Builder*, vol. xliii. pp. 136 and 700.
¶ 1885, vol. xlviii. p. 2.
** The *Builder*, 1882, vol. xliii. p. 675, gives "Characteristics of Ephesus," by Shaftesbury; and 1889, May 4, vol. lvi. p. 325, "Architectural Remains of the Archaic Temple of Artemis at Ephesus," by Mr. A. S. Murray, reader at the Hellenic Society.

Illustrations.

THE NEW PALACE OF JUSTICE, ROME.

IN 1887 the Italian Government opened a competition for the erection of a Palace of Justice, which was won by Prof. William Calderini. The area on which this edifice will be built is in the prati di Castello, to the east of Castle S. Angelo, opposite the new bridge Umberto I.

The works, which were commenced last year, are being continued rapidly, and besides the excavations which have been executed on the vast area, in order to lay the foundations, the extensive platform of concrete, on which the edifice is to be raised, has already been completed.

The building will contain the following departments:—1. A basement floor, inwardly communicating with the ground-floor, which is accessible on all sides to carriages for prisoners and witnesses, and for the general business or trade traffic of the building. 2. The ground-floor, containing the Corti d' Assize, the Pretura Urbana, the Sezione del Tribunale Correzionale, and the Officio del Registro 3. The first floor, in which will be the Corti di Cassazione and di Appello, the principal hall for general meetings, and the library of the Corti and of the Publico Ministero. 4. A special staircase will be constructed to communicate with the two courts independently from the other entrances. 5. The second floor will contain the Tribunale Civile, the Tribunale di Commercio, the Consiglio dell' Ordine degli Avvocati, and the Tribunal of discipline for the Procuratori, and the Biblioteca delle Autorità Giudiziarie. 6. The entresols will be used as Chancery offices, archives, &c. 7. Eight large courtyards will be provided for air and light; of these, the four central ones will be 50 mètres in length and 23 mètres in breadth.

The whole edifice will be mainly built of bricks, but it will be faced with travertine marble up to the windows of the ground-floor, and the rest of the decorations will be in cement. The ceilings of the portico and of the principal halls, as well as the architectural and ornamental decorations in the Palace, will be of brick, covered with fine plaster. The pavement of the basement will be of asphalt and Peperino stone, where carts or wagons will have to pass; the other floors will be paved in the so-called Venetian manner. The steps on the outside will be of Travertine marble; those in the palace itself of Tuscan *pietra serena*, while the principal staircase will be entirely of Carrara marble.

The architect has evidently aimed at giving to the design the stern and severe character which is best suited for the architectural treatment of a Palace of Justice, and the scale of the building is so large that it will assert its importance even by the side of the great neighbouring mass of the Castle of St. Angelo; and on the whole it may be said to be, in its severe dignity of style, a modern building not unworthy of its site and surroundings.

PRESBYTERIAN CHURCH, NORTH DULWICH.

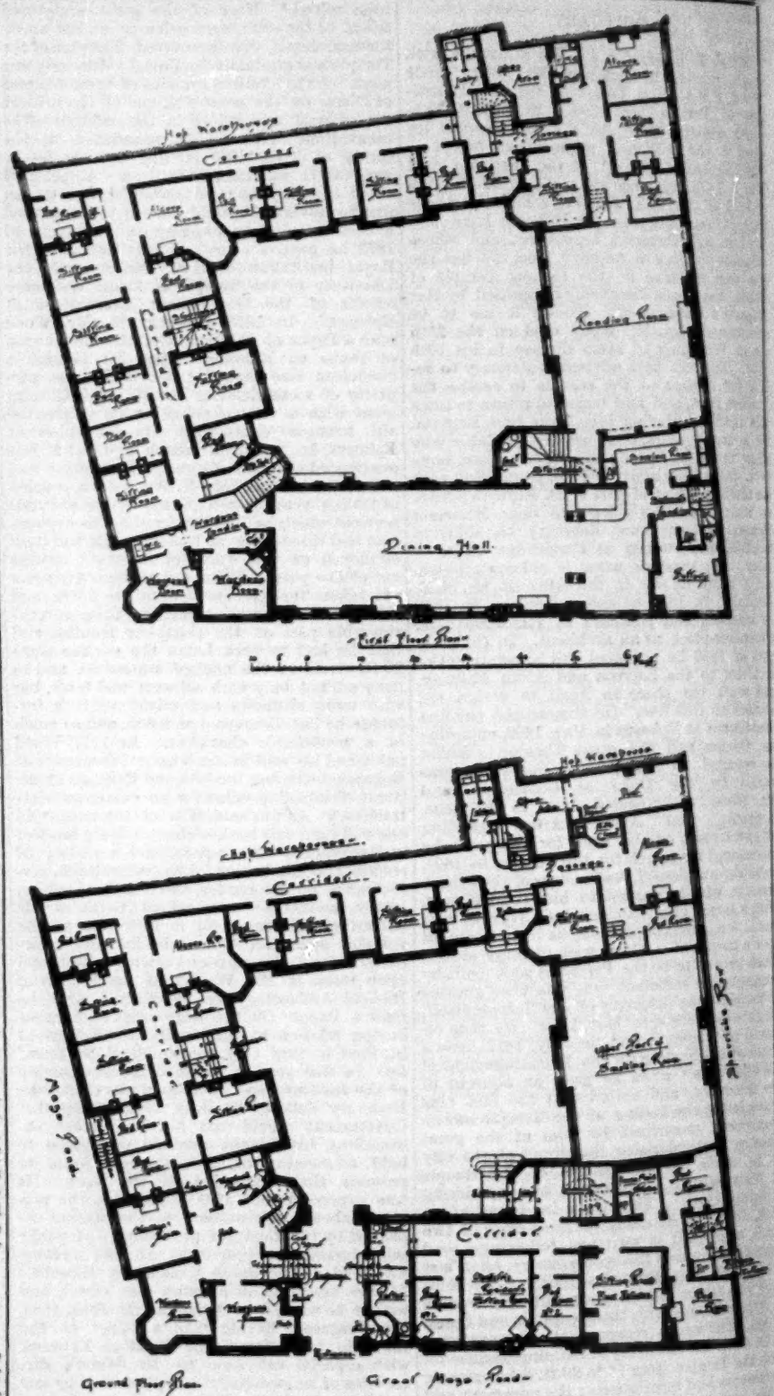
ABOUT four years ago an effort was made to organise a congregation for service according to the Presbyterian ritual, and there being a large number of Presbyterians in and near Dulwich, the matter was warmly taken up, and by the exertions of the energetic minister, the Rev. Rupert Patterson, a regular service was organised in a temporary building, and funds collected for a permanent structure.

An excellent site has been secured on the Dulwich College Estate, at the corner of Townley-road and East Dulwich-grove. Plans have been prepared by Mr. Charles Barry, architect, as here illustrated, to accommodate about 500 worshippers, at an estimated cost of 5,200*l*., including not only a church, but large lecture-hall, class-rooms, vestry, &c. Funds have been collected or promised sufficient to proceed with the erection of the church, and this will be immediately commenced.

HOLY TRINITY SPIRE, COVENTRY.

THE view of this spire, one of the famous three, is from a sketch made by Mr. C. E. Mallows on his tour as Pugin Student.

The sketch was made from the roof of the north aisle of St. Michael's Church, some portions of which form an effective foreground.



Guy's Hospital College.

LODGE, GUARDS' CORNER, DITCHAM PARK.

THIS lodge has a plinth of red bricks, the upper part being entirely composed of timber and concrete panels, with a roof of Brosely tiles. The architect was Mr. Walter F. Cave, and the builders were Messrs. J. Simpson & Son.

GUY'S HOSPITAL COLLEGE.

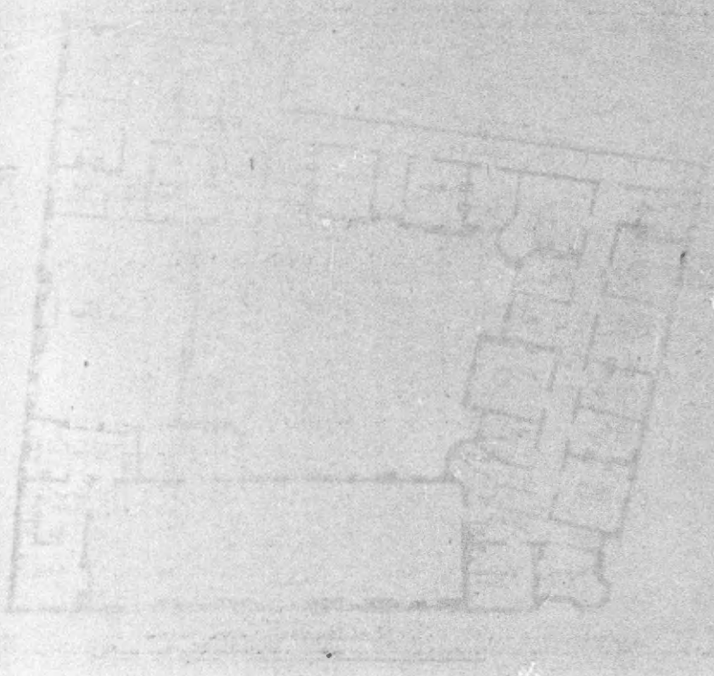
THIS building has been erected from plans prepared by Messrs. Woodd & Ainslie upon a site in the immediate neighbourhood of Guy's Hospital, with the view of providing suitable residential accommodation for about forty students and fourteen officers of the medical school connected with the hospital.

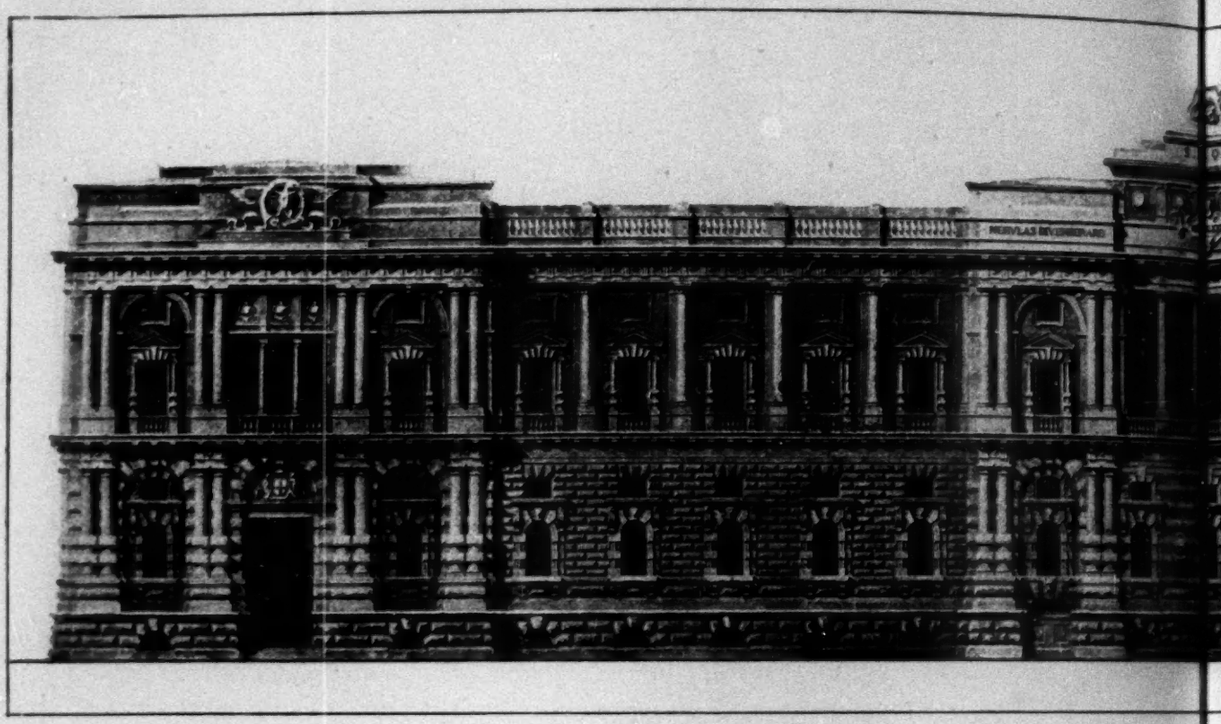
The scheme is based upon the life in vogue at our old universities. A set of two rooms, or a bed and sitting-room combined, is provided for each resident, and also a smoking-room, reading-room, and dining-hall with lavatories, kitchens, and offices for the use in common of the members of Guy's Hospital Students' Club and the residents in the College. A gymnasium (not shown on the plans) has, through the generosity of a member of the medical staff, been constructed under the courtyard.

A subway connects the college with the hospital for the convenience of those engaged on night duty in the wards. The basement contains bath-rooms, and accommodation for the housekeeper and servants in charge of the institution.

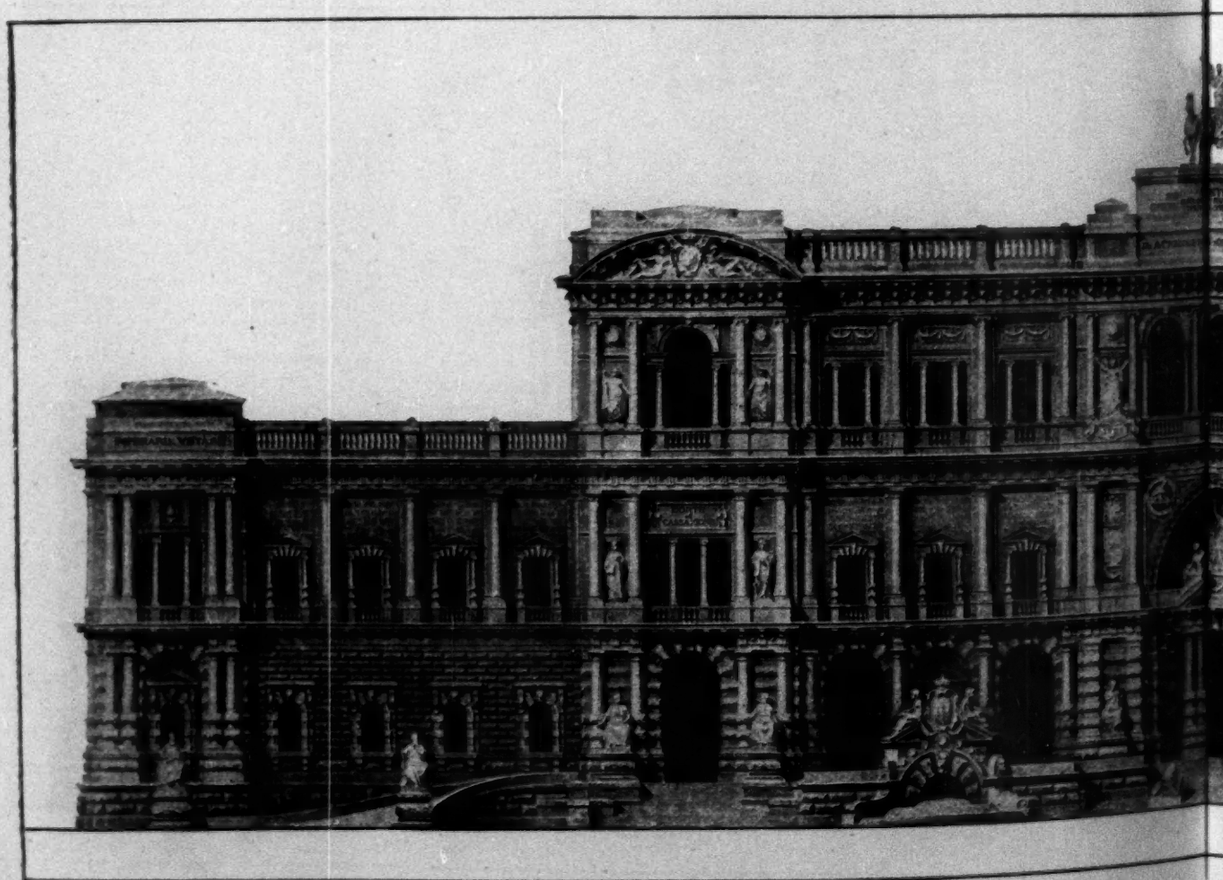
The building, satisfactorily completed under the superintendence of Mr. Powell as foreman and Mr. Abbott as clerk of works, was formally opened on March 26 by the Right Hon. W. E. Gladstone.

Messrs. Shillitoe & Son, of Bury St. Edmunds, were the general contractors. Messrs. Berry & Sons, of Westminster, executed the club cooking apparatus and hot-water work, and Messrs. Clark, Bunnett, & Co., the hydraulic lifts throughout the building.



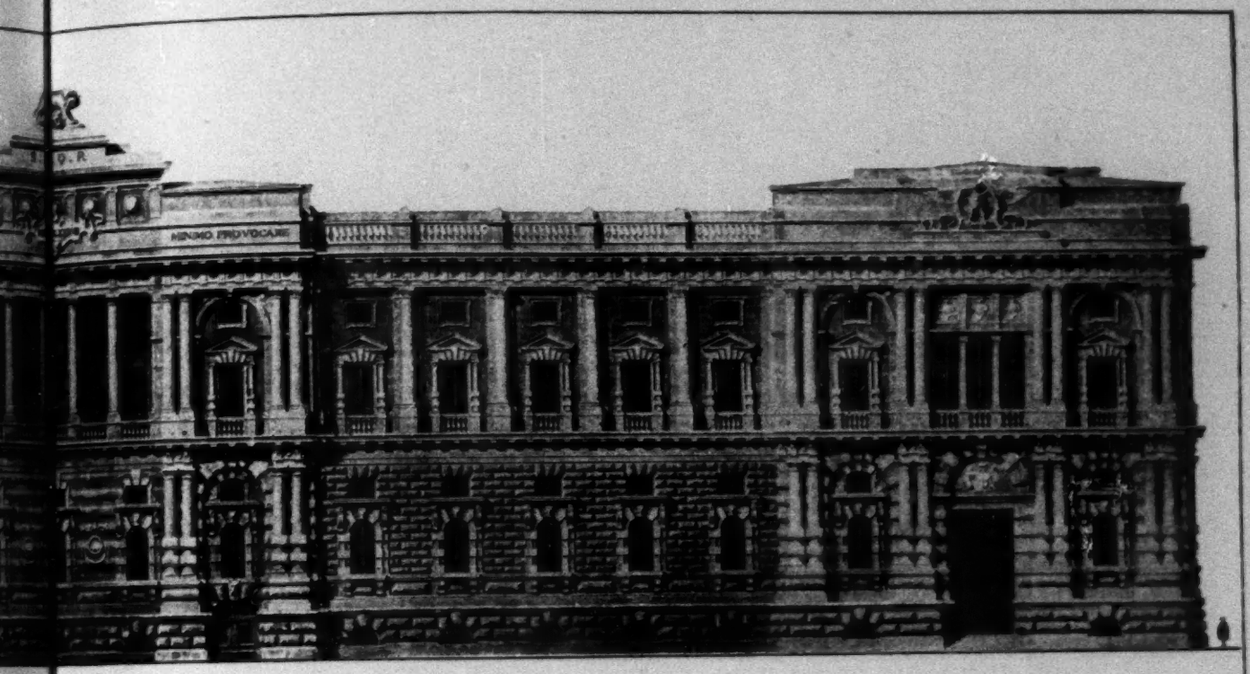


SIDE ELEVA

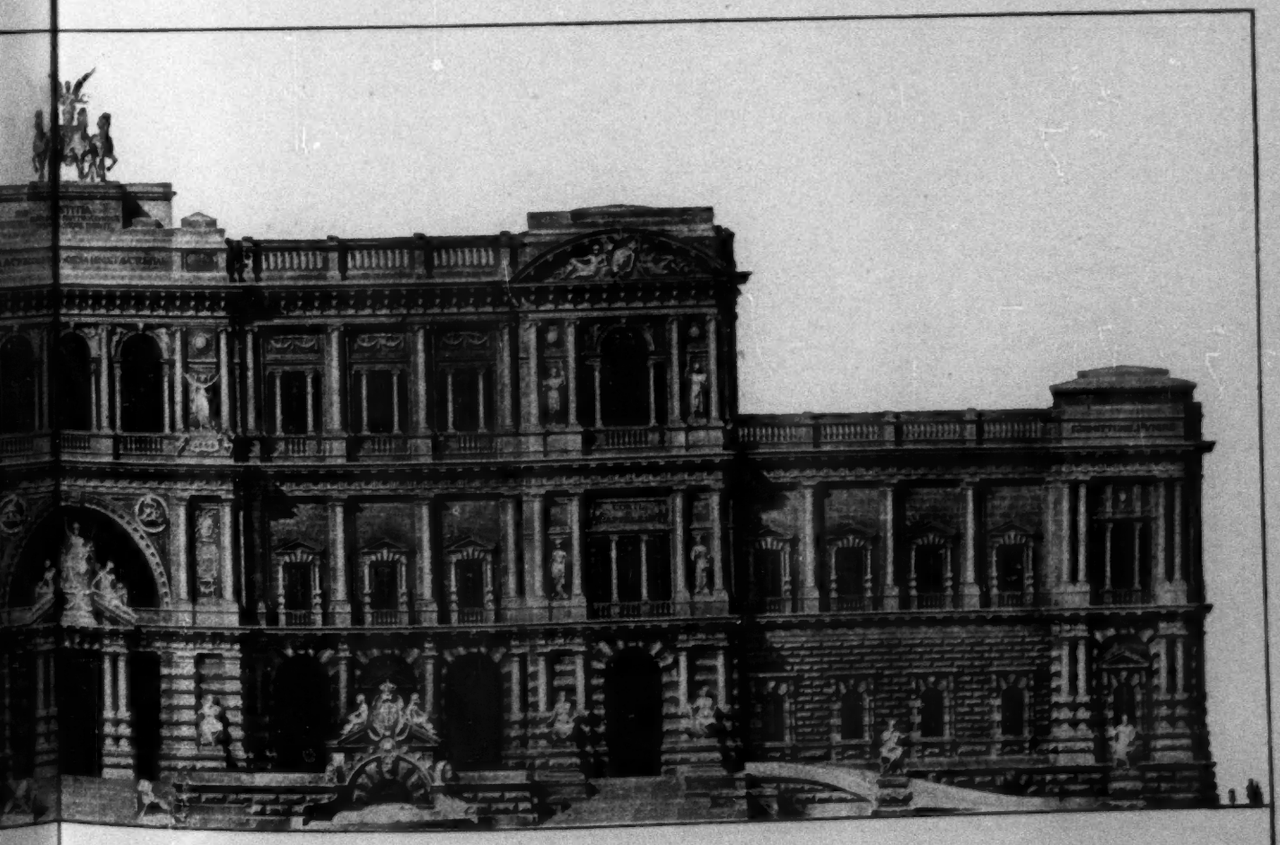


FRONT EL

THE NEW PALACE OF JUSTICE, RO



SIDE ELEVATION.

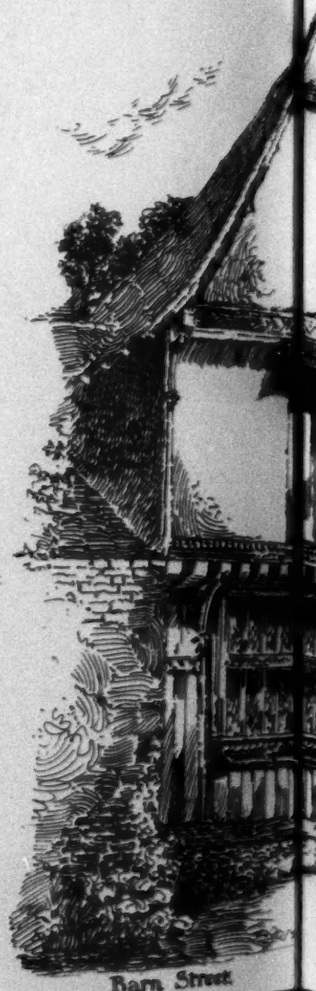


The Phototype Co., 188, Strand London.

FRONT ELEVATION.

CE, ROME. PROFESSOR CALDERINI, ARCHITECT.

Wayside Notes in Lavenham Streets



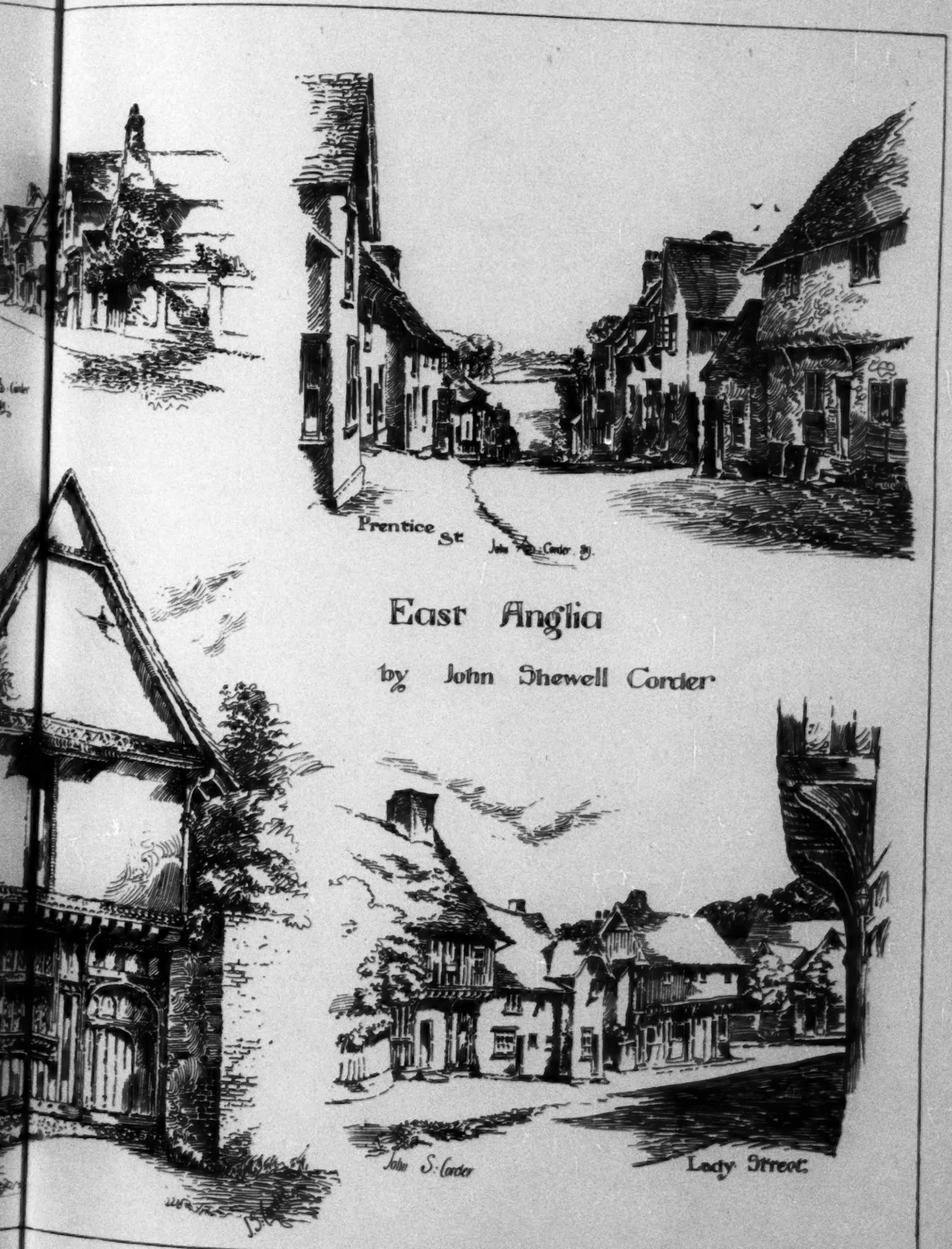
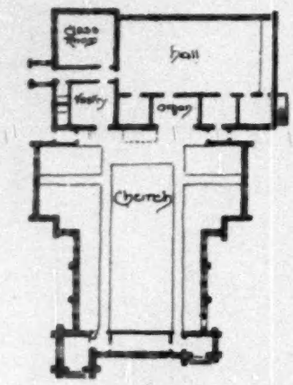


PHOTO-LITHO. SPRAGUE & CO. 22, GARTING LANE, CARMON ST., LONDON, E.C.

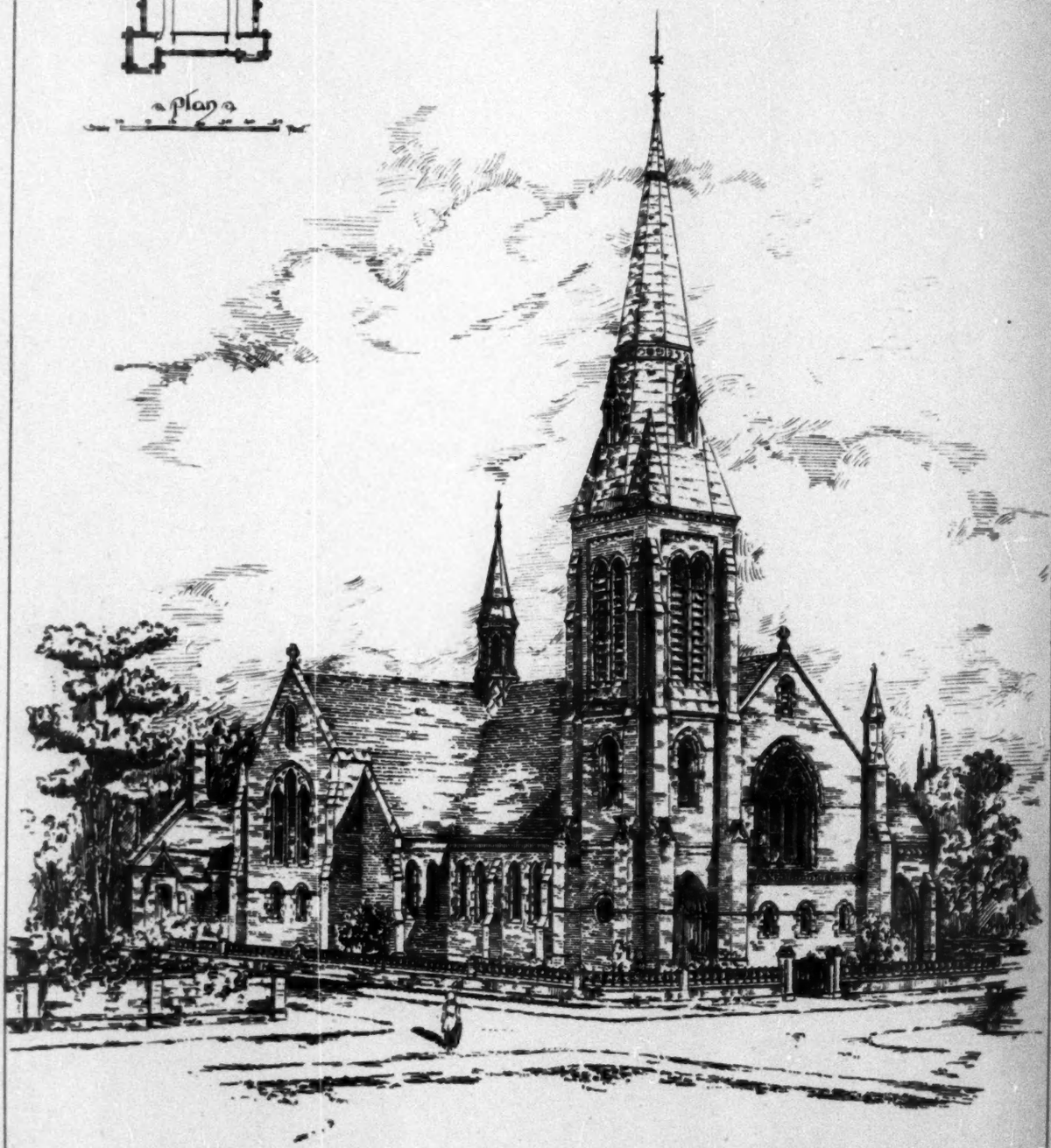
THE LODGE AT GUARDS CORNER, DITCHAM PARK.

GENERAL BINDING CORPORATION
CHICAGO



Plan

Christ Church, North Dulwich
Presbyterian Church



Charles Barry
Architect

PHOTO-LITHO. SPRAGUE & Co. 62, MARTINS LANE, CANNON ST., LONDON, E.C.

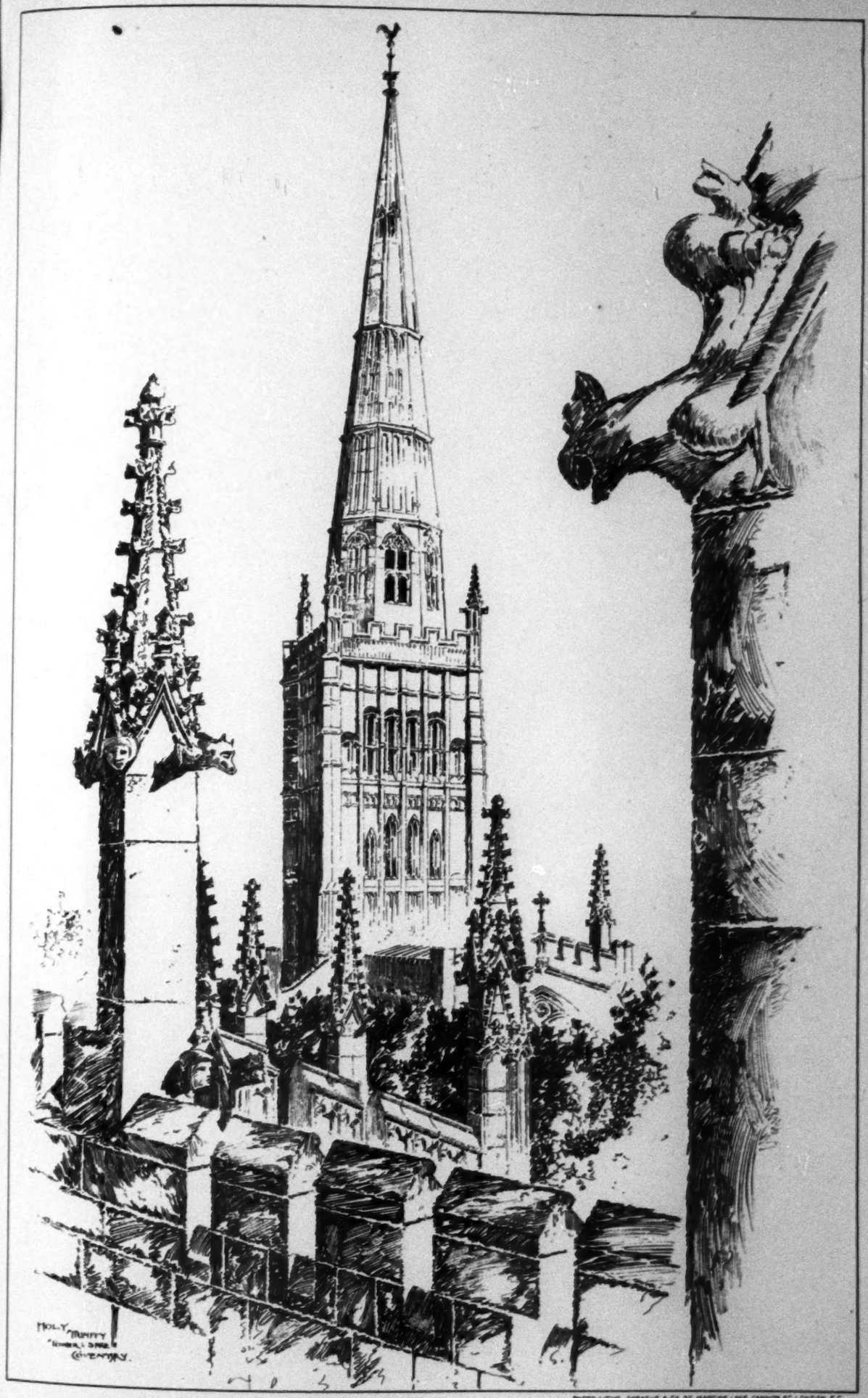
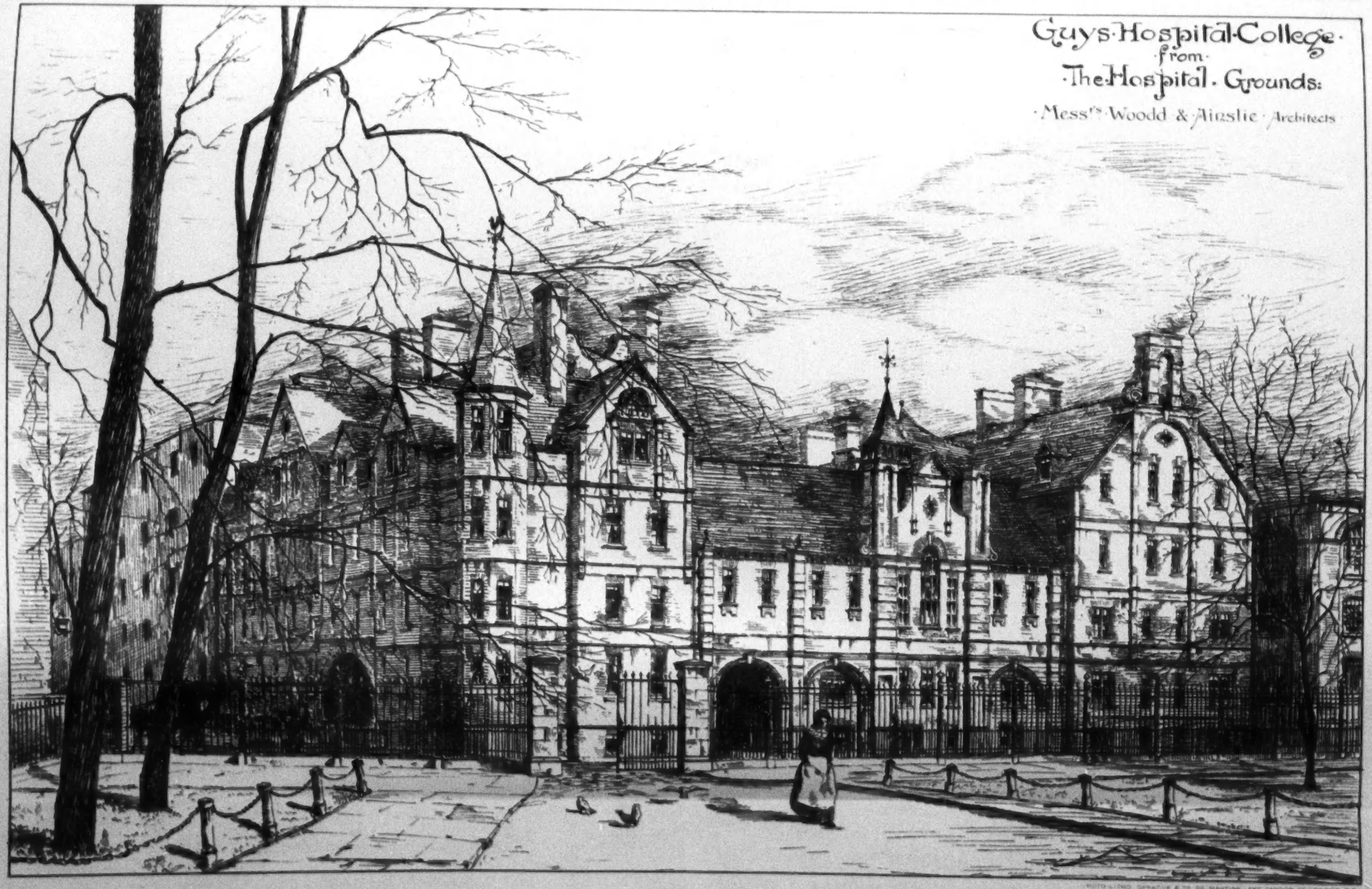


PHOTO-LITHO. DRAGUE & CO. 32, HARTING LANE, CANNON ST. LONDON, E.C.

HOLY TRINITY TOWER, COVENTRY.—From a Sketch by Mr. C. E. Mallows.



Guy's Hospital College from The Hospital Grounds.

Messrs Woodd & Ainslie Architects

Red brick has been used throughout for external facings, and the roofs are covered with green Belgian slates.

WAYSIDE NOTES IN EAST ANGLIA:

LAVENHAM STREETS.

In previous notes on Lavenham I have treated somewhat fully on the circumstances and causes of its rise and prosperity, so shall content myself with a few brief remarks upon the subjects I have depicted. One can but imperfectly realize, unless a visit be paid to the town itself, how rapidly it must have sprung into importance, the construction and design of its buildings exhibiting such a marked similarity. Only here and there we see the continuous line of jetty-houses broken by the insertion of a red or white brick front, erected in later times by some ambitious owner over the old timber framing, causing a somewhat disquieting break in the restful freedom of the old outlines. The houses remain little altered, whilst the undulating nature of the situation (for there are no level streets), combined with the quaintness of the architecture, constitute at every turn views full of picturesque completeness. The ugly sash window has supplanted the original casement, the ledged door has gone down before the four-panel trade mould invention, and the chimneys are crippled and mutilated beyond recognition. Still the outlines of the post-and-pan walls and high-pitched roofs remain, whilst the interiors are rich with carved and moulded beams and joists, to the beauties of which the present humble occupants are strangely insensible, ruthlessly covering them over with plaster.

The sketch in the centre of the sheet shows a mediæval house almost complete in all its details, excepting that the chimney and the portion to the left have been taken down.

There is a large entrance door, with a smaller door opening in the centre of it, leading into a hall, about 5 ft. wide, running the whole length of the building, with a small door at the end communicating with the garden. From this hall two Tudor-headed doors, separated by an upright stud, lead into two reception-rooms, and the staircase was placed at the garden end of the hall, and gave access to two rooms overhead, partly in the roof. The kitchen and room over, which would be to the left of the building, have been taken down, and the building is now used as a stable and coach-house.

The overhang is only carried out to the street, and the bay windows, the lower one of which is perfect, finished under the overhanging on each floor. On the ground-floor the small lights above the transom of the bay were continued along the front on each side, after the manner of the Old Guildhall. This house is an excellent example of timber-framed construction, and is worthy of a careful study. The studs showed inside and out, for at this period panelling was unknown. The fireplaces were large open ones, with just a cambered and moulded oak beam over the opening. Doors were simple in construction, being formed of moulded upright boarding nailed to ledges, and hung on wrought-iron band hinges. The floor boards were laid in rebates in the joists, and ran the same way as the joists themselves, the back of each joist forming part of the floor.

The value of passages as a means of communication was little appreciated, as we fail to find them in houses of this date, all the rooms communicating one with another. Stairs either went up straight between walls, or were constructed round a centre newel. Balusters had not come in, and the stairs themselves were solid balks cut through diagonally and resting on strong bearers.

Another feature introduced at a subsequent date was the plastering over of the external face, which was largely practised in Elizabethan and Jacobean times, the shrinkage of the clay filling from the oak studs giving unwelcome access to the weather. The Tudor rose, the fleur-de-lis, and the bishop's mitre, supposed to be in honour of St. Blaize, patron of the wool trade, are frequently to be met with on the Lavenham houses, and on several the rose has six petals, instead of five, as is most usual.

Prentice-street gives a good idea of the hilly nature of the streets. It is the steepest gradient in the town, and the stepping of the houses with the prospect of the open country beyond is a fine subject for an artist's pencil. In conclusion, I would advise those who are interested in old timber construction to visit this place; they will find much to attract their attention in rambling through the streets, whilst an inspection of the interior of some of the more perfect structures will reveal unsuspected beauties in the shape of carving and moulding which will excite at once their wonder and admiration.

JOHN SHEWELL CORDER.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

The monthly meeting of this Society was held at the Montgomery Hall on Tuesday evening last. Mr. F. Fowler, the President, occupied the chair, and there was a good attendance of members, including Messrs. C. J. Innocent, Vice-President; C. Hadfield, Hon. Secretary; J. B. Mitchell-Withers, J. D. Webster, W. F. Hemsoll, J. Smith, J. Fawcett, W. C. Fenton, H. W. Lockwood, J. T. Wheen, J. McInery, &c. Mr. W. Farrington was proposed by Mr. C. Hadfield and seconded by Mr. J. B. Mitchell-Withers for the Associateship.

Mr. Thomas M. Rickman, architect and surveyor, of London, read an exhaustive paper on "The Present state of Questions Relating to Quantities." The object of the paper, he remarked, was to enable the Society to discuss the position which the quantities now take in estimates and contracts. Precise definition was desirable to avoid misunderstandings as to materials, designs, and mode of measurement. The variety of terms in use throughout the country, and their derivations, and the changes in design and style of architecture, and in the present purposes of buildings, have all complicated the subject. The custom for architects to prepare quantities for their own works, implied that the preparation of quantities was part of an architect's education. The position of the Royal Institute of British Architects, as regards this practice, had somewhat changed of late. The lecturer described the different duties required of an architect, and enlarged on the value of a surveyor's services as regarding the more important class of work. The appointment of the measuring surveyor, once usually made by the builder, was now commonly made by the architect for his client. The appointment of a surveyor, who from his position could insist on justice for both parties, which, in some instances, the architect was unable to obtain, was of great importance. The growing practice of making the quantities part of the contract was considered, and the arguments on both sides of the question. The present position of the Builders' Institutions, and of those of architects and surveyors with reference to the appointment of quantity takers, were explained, and the extent of responsibility resting with the supplier of quantities considered. The report of the committee appointed by the Conference of Architects held in London in 1871 was given in detail. The position of architects supplying quantities for their own works was gone into by the lecturer, who pointed out the special difficulties which they must encounter in the settlement of accounts, which had led the committee before mentioned to recommend that quantities so supplied should form part of the contract. The complications arising from a course occasionally taken of throwing on the builder the onus of testing the quantities so furnished, and the consequences to the employer from the insertion of such a clause, were obvious. In conclusion, Mr. Rickman recommended a uniform system of measurement, and the diffusion amongst employers and their solicitors of a larger amount of knowledge as to the bearings of all these questions upon their own interests.

An interesting discussion took place, and on the motion of Mr. Innocent, seconded by Mr. McInery, and supported by Messrs. C. Hadfield, J. B. Mitchell-Withers; W. C. Fenton, H. W. Lockwood, and the President, a hearty vote of thanks was awarded to Mr. Rickman for his paper.

Window, Ranmoor Church, Sheffield.—We find that the design for the window by Messrs. Shrigley & Hunt, published in our last, is not, as we supposed, the one executed, but was a design submitted in competition. The actual window placed in the apse of the church was executed by Messrs. Heaton Butler & Bayne from a design by Mr. G. Moore M'Dowell.

THE INSTITUTION OF CIVIL ENGINEERS:

LOUGH ERNE DRAINAGE.

At the sixteenth Ordinary Meeting of the Session, on Tuesday, March 18, Sir John Coode, K.C.M.G., President, in the chair, the Paper read was on the "Lough Erne Drainage," by Mr. James Price, jun., M.Inst.C.E.

The physical characteristics of the Lough Erne district, comprising 1,056,160 acres, were first described, and the various schemes proposed at different times for effecting the drainage of the district, without lowering the navigation level, were referred to. The works which had been carried out were designed by Mr. James Price, sen., M.Inst.C.E., in 1878, and consisted in cutting a channel through a rocky barrier at Belleek, on the River Erne, below the Lower Lough Erne; controlling the discharge through this channel by large sluice-gates; and improving the channels above Belleek and between the two lakes. The sluice-gates, when closed, retained the water at its normal summer level; whilst the raising of the gates, on the first intimation of heavy rain commencing in the upper districts, enabled the large water-surface, of 27,643 acres on the lower lake, and 9,453 acres on the upper lake, to be drawn down 6 inches, so as to make provision for a flood in anticipation of its arrival, and thus prevent the flooding of the adjacent lands. The works were commenced in 1882, at the lower end, and the sluices were completed in September, 1883, the upper works being subsequently carried out. The channel at Belleek was excavated under the protection of clay dams; and the upper channels were mainly improved by dredging. The four sluice-gates,* designed by Mr. F. G. M. Stoney, M.Inst.C.E., sliding against a train of 8-inch live rollers, were 29 ft. 2 in. wide and 14 ft. 6 in. high, and capable of being raised 9 ft., and had been working most satisfactorily for the last six years. Each gate weighed 13 tons, and could be easily raised by one man to its full height in forty-five minutes; or the four gates could be lifted simultaneously by a turbine in half-an-hour. Their total cost, exclusive of masonry, was 4,000*l*. Large compensation had to be paid for anticipated injury to the fishery-rights, though the works had actually improved the salmon fishery. The total cost of the works was 180,000*l*., of which 30,000*l*. was for navigation and 150,000*l*. for drainage. The author was the Resident Engineer for the whole of the works, and the lower works were carried out under his supervision; whilst the works between the lakes, and in the upper lake, were executed by contract. Observations of the rain-fall, lake-levels, and sluice-discharges, for the years 1885-88, had been put in the form of a diagram. Allowance had been made for a discharge of 600,000 cubic feet per minute, of which 400,000 cubic feet had been provided for by enlargements of the channels; but it appeared from the diagrams that, owing to the power of anticipating a flood by means of the sluices, a discharge of 500,000 cubic feet per minute would have sufficed to prevent flooding, without unduly lowering the navigation level of the lakes. The Erne diagrams showed how little the storage in the lakes affected the summer flow, and indicated that the great store for the summer yield of a river was the ground-water. The general effect of the Erne drainage had been to render the water-level of the lakes more uniform—higher in summer and lower in winter. The bad effects of the flooding, during a wet summer, of the extensive flat lands bordering Lough Erne, which extended in an unbroken sheet of water for fifty miles, were not confined to the loss of the year's crop of grass, for the decayed grass affected the next year's hay crop; whilst large tracts of undrained land, by exposing large surfaces of spongy grass to evaporation, chilled the air, preventing or delaying the ripening of corn; and the damp chilled air, mixed with the products of decaying vegetation, fostered disease. In some cases, occasional flooding might be beneficial to land, owing to the manurial qualities of the flood deposits; and sluices enabled such flooding of flat lands to be effected, for short periods, at suitable seasons.

The author advocated the following general principles in designing drainage works:—(1) That the cross section of the enlarged channels should be hyperbolic instead of trapezoidal, increasing the discharge in proportion to the

* *Engineering*, September 19, 1884, Vol. xxxviii., pp. 268-270 and 272. *The Engineer*, September 19 and October 10, 1884, vol. lviii., pp. 218 and 232-234.

section, obviating slips by flattened slopes next the land, facilitating dredging, and confining the low-water-channel so that the sides could be cleaned; (2) that the channels should be given a fall of only 1 ft. or 2 ft. per mile, with embankments and back drains where necessary, and accumulating any excess of fall at certain points where the discharge might be effected along paved channels. Embankments were generally avoided in Ireland; but it was clearly a mistake to lower a large river in order to preserve a small area of land from flooding. Though not applicable to the Erne, embankments should be used for the Barrow drainage. The extension of arterial drainage in Ireland would render large areas of land available, and would raise the mean summer temperature, which at present was only 58 deg. Fahr. Amended laws, however, would be required for carrying out any large drainage works in the future, and the initiation of the schemes could no longer be left to the landowners who, under their altered conditions of tenure, had lost their former interest in the improvement of their estates.

THE BARRY DOCK-WORKS.

AT the eighteenth ordinary meeting of the session, on Tuesday, April 1, Sir John Coode, K.C.M.G., President, in the chair, the paper read was "On the Barry Dock-works, including the Hydraulic Machinery and the Mode of Tipping Coal," by Mr. John Robinson, M.Inst.C.E.

Barry Dock was situated on the north shore of the Bristol Channel, between Barry Island and the mainland of Glamorganshire, seven miles in a direct line south-west of Cardiff. The site chosen for the dock occupied the eastern portion of the channel which formerly ran between the island and the mainland. An Act of Parliament to authorise the construction of the dock, and the railways connected therewith, obtained the Royal Assent on August 14, 1884. The undertaking comprised a tidal basin of 7 acres, a dock of 73 acres, and a timber-pond of 24 acres. The entrance to the dock was at the eastern end of the island, under the shelter of the high land of Nell's Point. This excellent natural shelter was supplemented by two outlying converging breakwaters. The tidal range was 36 ft. at ordinary spring-tides, increasing to 40 ft. at extraordinary springs; and 19 ft. 6 in. at ordinary neaps, diminishing to 16 ft. at extraordinary neaps. The dock was not fed with water from any river. The width of the entrance between the masonry walls was 80 ft., and gave access to the basin. In the entrance was placed a single pair of wrought-iron gates, and the dock not being exposed to heavy seas, there were no gates pointing outwards. The passage between the basin and the dock also had a width of 80 ft.

The dock was 3,400 ft. in length, the maximum width being 1,100 ft., divided at the western end by a mole into two arms, the full width being left at the eastern end for a length of 1,600 ft., where vessels of the largest class could swing. The bottom of the dock, which was not puddled, was 20 ft. below mean sea-level. The mole was 1,300 ft. in length and 200 ft. in width, with pitched slopes of 1½ to 1 on the north side, and of 2 to 1 on the south side. Along the northern side of the dock were eleven high-level tips, and on the northern side of the mole were three low-level fixed tips, and masonry towers for two others had been built. Two more low-level tips were stationed on the south side of the dock, and one at the western end. To prevent the basin and docks being flooded whilst the temporary stone dam was removed, a caisson was erected, which could be used for future requirements.

The breakwaters were formed of rubble excavated from the basin and railway cuttings, and the sea slope was protected by blocks of mountain limestone, weighing from four to seven tons each. At the head of the west breakwater there was erected a cast-iron tower, 30 ft. in height, the diameter at the base being 7 ft. 9 in., and at the top 6 ft. 6 in. with a spiral staircase inside. In the tower was placed a fourth-order dioptric occulting white light, visible in clear weather at a distance of ten miles.

The hydraulic power was obtained by means of two pairs of compound horizontal condensing pumping-engines of the tandem type. The boiler pressure was 80 lb. per square inch, and condensing water was obtained from, and returned to, the dock through pipes 15 in. in diameter, by the circulating-pumps. Another hydraulic engine-house was in course of construction at the north-west end of the dock.

The entrance from the sea into the basin, and the passage between the basin and the dock, were each provided with a pair of wrought-iron gates, having a span of 80 ft. and a rise of 20 ft. There were six sluices in each leaf, having a combined area of 100 square ft. These were worked from the top by direct-acting hydraulic cylinders and pistons. The gates at the entrance were opened and closed by hydraulic power, chains being dispensed with. The water was admitted to a direct-acting hydraulic cylinder, having a piston 2 ft. 5¾ in. in diameter, and a ram 1 ft. 9 in. in diameter, with a stroke of 25 ft. 9 in., attached direct to the gate, the cylinder being in three parts of cast steel. Trunnions were cast on the cylinders, projecting above and below, and pivoted in saddle bearings, which also had trunnions on their sides, and these pivoted in bearings fixed to the walls of the ram-chamber, thus permitting the cylinder to oscillate both horizontally and vertically. The hydraulic rams were of sufficient strength to resist shocks of waves, and to hold the gates rigidly during movement. The passage gates were worked in the same manner as those at the entrance; but in this case the ram was attached to a radius arm near the top, with a slide against the back of the gate, the other end of the arm working on a pin in the holding-down bracket over the top of the heel-post. As the power required was less, the diameter of the piston was only 2 ft. 1¼ in., and that of the ram 1 ft. 6 in., with a stroke of 16 ft. 7 in. The cylinder for the passage-gate machine was of iron, cast in one length, and tested to a pressure of 2,400 lbs. per square inch. The ram was also of cast-iron, and the whole machine was arranged in a similar manner to that for the entrance gates. For the protection of the gates stout chain-cables and wrought-iron box booms were placed in front of the masonry. To prevent the gates rising and floating away, a cast-steel holding-down bracket was provided at the top of each heel-post. The ordinary time occupied in opening the gates was one minute and a-half, and the same in closing; but those at the passage occupied less than a minute in opening, and the same in closing.

The following modes were adopted at Barry for the shipment of coal, where it was shipped both from high and from low levels. On the high level the trains were backed into curved sidings intended for full wagons, where the engine left them. These sidings were on gradients of 1 in 233. No stop-chocks were employed, neither had they been found necessary. The loaded wagons were sent from the collieries with the doors up-hill, to prevent their opening on some of the steep inclines in the valleys, and did not therefore require to be turned for tipping when shunted into the sidings, thereby saving both time and labour. The wagons were drawn forward, and run one by one on to the weigh-bridge, and afterwards drawn on to the coal-tip by means of another hydraulic capstan. The coal-tips consisted of masonry towers, 30 ft. square, on which were erected wrought-iron framings, braced together by angle, tee, and bar irons. This framing served to support the wrought-iron guides for the cradle. The latter was provided with the necessary tip-up table, hinged in front, and worked by hydraulic power, by means of a cylinder hung on trunnions to girders underneath the cradle, which travelled with it, and capable of tipping loads up to 19 tons. The tips were provided with coal-shoots, anti-breakage cranes, boxes, &c. The shoot was tapered towards the point, to check the sliding of the coal, and had a single door across near the end for regulating the same. In the bottom plate of each shoot were two iron bar screens for separating the small coal when required. On the underside of the shoots, immediately below the screens, were hinged doors to allow of single-screening, double-screening, or the passage of the coal unscreened. At one of the high-level tips 400 tons had been shipped in one hour in the ordinary course of working.

The tips on the low level differed from those on the high level, insomuch that wagons were received into the hoists at quay level, and the empty wagons were returned from the tip at the same level. The wagon had thus to be lifted the required height for tipping. A movable tip was in course of construction for the high level, which would run on rails along the quay for a distance of about 50 ft. each side of the centre of approach, and could be used in connexion with a fixed tip. The tip was moved by a hydraulic engine geared to the travelling wheels. There was also a movable tip in course of construction for the low level. The passage was crossed by a rolling bridge, worked by hydraulic power, carrying a single line of railway and forming part of a roadway. There were eleven movable cranes, capable of lifting from 30 cwt. to 4 tons, for loading and discharging cargoes of vessels lying along the quay wall and against the timber jetties at the east end of the dock. The cranes were of the elevated type, and constructed on a pedestal of wrought-iron plate, with an arch underneath for the wagons to pass while the cranes were at work. The dock and sidings were lighted by electric light. The engineers of the dock works were Mr. John Wolfe Barry, Mr. T. Forster Brown, and Mr. H. M. Brunel. The author was the resident engineer.

The discussion upon the foregoing paper was commenced, but not concluded when the time for adjournment arrived. It will be resumed after Sir Frederick Bramwell's paper, to be read on Tuesday next, has been disposed of.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.

AT the monthly meeting of this Association, held at Carpenters' Hall, London-wall, on Saturday evening last, Mr. Hugh Alexander presiding, a paper on "Social Environment" was read by Mr. F. T. Poulson (Chief Inspector, Chelsea). In regarding man as a gregarious animal, the lecturer found his leading characteristic to be voracity. He had an insatiable and omnivorous appetite, both as regarded what he ate and what he drank. Another characteristic of man as animal was his indifference to the quality of what he consumed, and the ingenuity he displayed in vitiating even the breath of life itself. In many dwellings every inlet and outlet for air was carefully choked, the occupants being in consequence pale, weakly, and anæmic. The method of introducing currents of warmed fresh air, by admitting them through flues behind the fireplace, as advocated by Sir Douglas Galton, was commended in this connexion. Some good had followed such revelations as those in "How the Poor Live;" but immense was the ignorance that still prevailed on the subject of sanitation and the use of such sanitary appliances as were now commonly applied to dwelling-houses. Wherever the surroundings, whether dampness of sites, or walls, or other defects, were the cause of fungoid growths on the walls, similar growths in the animal membrane were to be feared in the fearful form of diphtheria, the worst zymotic of whose existence the lecturer was aware. On the question of water-supply, "a compulsory constant service" was advocated, and the withdrawal of the power of cutting off a service for any cause. An intermittent service was liable to constant pollution from the sucking in of noxious matter from water-closet, soil-pipe, house-drain, or other sanitary arrangements of the dwelling to which the fittings might be connected. As an illustration of this danger, he exhibited a small sketch, showing how a kitchen-boiler was supplied with sewage in his district, owing to the overflow-pipe of the feed-cistern being connected directly to the house-drain. The drain becoming obstructed, and the water-closet being at a higher level than the top of the overflow-pipe of the cistern, when the closet was used the sewage was forced up the overflow-pipe into the cistern, and thus sent into the kitchen-boiler. This showed how easily a family might be poisoned by a plumber's defective work. With regard to the removal of refuse, the lecturer preferred to see it carried away in closed vehicles to be applied to the soil as manure, in place of burning it in "destructors." The paper next touched upon the disposal of the dead, and, without absolutely declaring it, the principle of cremation was upheld, with a recommendation that the residuum should be ground to powder for agricultural uses. The environments of childhood would never be what they should until mothers had more knowledge of the physical necessities of their children. The lecturer concluded by applying the Darwinian phrase, "the survival of the fittest," to the environments of man, and showed that a completer knowledge of physiology and sanitation meant for the work-

man and workwoman the retention of the earning and enjoying faculties for a longer period, and for the nation and the commercial world more profit, thrift, and industry, and therefore more peace and contentment both for capitalist and labourer.

A discussion followed, in which Messrs. Tidman, Dee, Fairchild, Woonton, West, Young, and the Chairman and other members took part. Some criticism was offered on minor points, but a general agreement with the views of the paper was expressed. Among other suggestions made in the course of the discussion was a recommendation to make the teaching of hygiene and physiology compulsory in all schools, and the abolition of cisterns, on account of their liability to get foul and to pollute the water available for drinking purposes.

A cordial vote of thanks was given to Mr. Poulson, who briefly replied, and the proceedings closed.

We understand that by invitation of the Mayor and Corporation of Leamington, the fifth annual provincial meeting of the Association will be held in that town on Saturday, May 24. The President and Sir Douglas Galton, K.C.B., have promised addresses on that occasion.

ST. SAVIOUR'S CHURCH, SOUTHWARK.

SIR,—You expressed a hope some weeks ago that something more would be done with the nave than to make an imitation, as nearly as possible, of what was done in the thirteenth century. Seeing that the choir suffices for the needs of the present congregation, would it not be better, when the ugly nave is pulled down, not to rebuild at all, but to utilise the space as a garden? With the money thus saved a good church could be built elsewhere. But if a new nave is built, I hope, as you do, that something more will be the result than a mere copy of what has been done in the past. When the late Chaplain (Mr. Benson) wrote the Guide to St. Saviour's, everyone was quite satisfied with a copy of the old masters, as the following words from the guide will tend to show:—"A very appropriate window has been introduced in the north wall (of the north transept), the original of which may be found in Westminster Abbey;" and speaking of the south transept: "The principal window having been destroyed, a new design, formed on the model of an exquisite circular window remaining in the ruins of the adjacent episcopal palace, was introduced." And it was not only in Gothic architecture that this want of originality was shown. The front of the Reform Club in Pall Mall resembles the Farnese Palace in Rome; and the Travellers' Club is supposed to be an improved version of the Padolfini Palace, Florence; and in the Carlton Club, Sidney Smirke copied the east front of St. Mark's Library, Venice.

I was hoping that the day for this kind of thing had passed, but it does not appear to have died out in church work yet. CHARLES F. MOXON.

STAINED GLASS.

Brecon.—The stained-glass window, from the studio of Mr. Taylor, of Berners-street, given by the South Wales Borderers (24th Regiment) in memory of their comrades who fell in the Burmah Campaign, has been erected in the Priory Church, Brecon, the territorial district of the Regiment. The memorial brass beneath it records the name of every man (fifty-one in all) who fell in action or died of disease during the campaign—1886-7-8.

Whitchurch.—On Sunday afternoon last the stained-glass window in the south aisle of Whitchurch parish church, in memory of the Rev. John Carter, who was vicar of Whitchurch for over ten years, was dedicated. The window is painted in two lights, with tracery, and the subject is "The Incredulity of St. Thomas." The central figure is that of the Saviour showing the imprints of the nails in his hands and feet to Thomas and two other disciples. Under the two groups, which are surmounted by canopies, are the following inscriptions:—"Peace be unto you," and "My Lord and my God." At the base of the window is written the following:—"In memory of John Carter, M.A., LL.B., 10 years vicar of this parish, who died 13th of April, 1888, aged 51 years." The work has been carried out by Messrs. Bell & Sons, of Bristol.

Aachen.—The restoration of the Municipal Buildings is to be carried out according to the designs of Professor Frengen, the latter having in his latest scheme paid special regard to the suggestions made by the Academy of Public Works when discussing the matter, September, 1888.

The Student's Column.

ELECTRICITY, MAGNETISM, AND ELECTRICITY SUPPLY.—XV.

SEPARATELY-EXCITED DYNAMO-MACHINE.

IF there were no reaction between the armature of a dynamo-machine and the field, the current which a separately-excited machine would send through any external resistance, when the armature was revolving at a known speed, could be calculated as easily as for an ordinary voltaic battery.

A set of working drawings of the machine, together with a knowledge of the materials from which it was constructed, would enable us to estimate the flux that would be sent through the armature, when the exciting current flowed in the field magnet coils (article X.), and the flux being known, the electro-motive force set up in the armature, if it revolved once in a second, could be immediately calculated (article XI.).

Let e = E.M.F. set up in armature when revolving once in a second; n = number of revolutions per second; r = resistance of armature from brush to brush; R = resistance of external circuit; C = current. Then:—

$$C = \frac{ne}{r + R}.$$

Since, however, owing to armature reaction, the value of e depends upon that of C, the above equation gives results very far from the truth when C approaches its ordinary working value. In the very simple case under consideration it would not be difficult to find an equation that would give, with considerable accuracy, the current produced by the machine under varying conditions of speed and external resistance. Graphical methods, however, afford means of dealing with machines in which the winding is complicated as easily as with the simpler forms; we shall, therefore, at once have recourse to curves.

A curve which shows the connexion between the electromotive force produced in the armature of a machine, the speed being constant, and the current flowing, is called a "characteristic curve." This curve is to the dynamo-machine what the indicator diagram is to the steam-engine. The characteristic curve, or briefly the characteristic, of a machine can be got experimentally by connecting it to a circuit consisting of an ammeter and a variable resistance, while a voltmeter is in connexion with its terminals. The readings on the ammeter are laid off as abscissæ to the curve; the current indicated by the ammeter is multiplied into the resistance of the armature, and the quantity so obtained added to the corresponding voltmeter reading, thus giving the actual number of volts set up in the armature, and these results are then laid off as ordinates. If a sufficient number of points have been determined in this way, the characteristic curve for the machine, when running at the speed at which the experiments were carried out, can be drawn through them. As the method of constructing a curve for a similar purpose has already been described in article X., no further description need be given here. The brushes are naturally shifted into the proper position before each reading is taken.

The main reasons why the characteristic curves of different kinds of dynamo-machines assume the shapes they do, may be easily seen by constructing their general forms theoretically, having regard merely to the components of the field due to the field magnets and to the currents circulating in the coils of the armature.

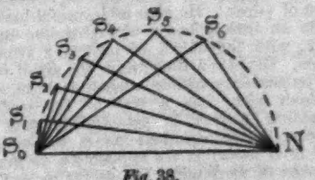


Fig. 38.

A construction was given in fig. 36 for finding the actual field, in magnitude and direction, for different positions of the brushes; in fig. 38 the same construction is used, but the diameter of commutation is always at right-angles to the resultant field. Draw NS_0 equal, on a suitable scale, to the field produced by the field magnets. As the machine is separately excited, this quantity has always the same value; with NS_0 as diameter, describe the dotted semicircle and draw the chords S_0S_1, S_0S_2 . . . . to represent the fields produced by the armature when the currents c_1 c_2 . . . . flow from it, then NS_1, NS_2 . . . . will be the resultant fields in each case.

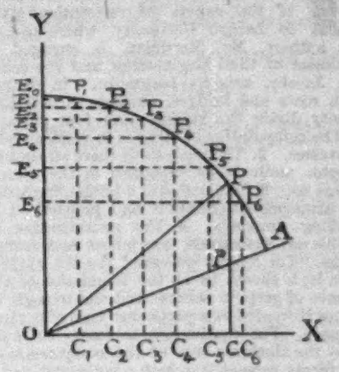


Fig. 39.

To construct the characteristic curve, fig. 39, on OX lay off lengths OC_1, OC_2 . . . equal to the currents c_1, c_2 . . . they will be proportional to S_0S_1, S_0S_2 . . . On OY lay off OE_0, OE_1 . . . equal to the electromotive forces produced at the particular speed at which the armature is running: these lines will be proportional to NS_0, NS_1 . . . Taking these two sets of values as abscissæ and ordinates, the points P_1, P_2 . . . P_6 are obtained, through which the characteristic curve can be drawn.

The characteristic curve, while primarily showing the relations between electromotive force and current under all conditions, can be used for determining many other quantities connected with the complete circuit. Let P be the point on the characteristic of a machine showing the electromotive force and current being produced. Join OP. If R is the total resistance in circuit:—$R = \frac{E}{c_1} = \frac{PC}{CO} = \tan POC$.

When, therefore, it is necessary to know what the machine will do when a certain resistance is placed in the circuit, from O draw a line so that the tangent of the angle it makes with OX is equal to the given resistance, and where this line cuts the characteristic at P, will be the point showing the behaviour of the machine under the given conditions.

In the figure, OA is the line of the armature resistance, so that the characteristic stops short at A, the machine being then short-circuited. This line is of great use in showing the electromotive force absorbed by the armature itself, and hence the balance left for use in the external circuit. In the case just considered, PC is the total E.M.F. developed, pC is the amount absorbed in the armature, and hence Pp the difference of potential between the terminals of the machine. Many other uses of characteristics might be catalogued here, but such uses as we shall require to make of them will be described when considering other kinds of dynamo-machines.

It may, however, be pointed out that if the characteristic (fig. 39) be that for when the armature is running at n revolutions per second, the characteristic at n_1 revolutions per second can be at once drawn by multiplying the ordinates by the constant $\frac{n_1}{n}$.

Civil and Mechanical Engineers' Society.—On the 2nd inst., Mr. Ernest Spon, Assoc. M.Inst. C.E., read a paper before the Civil and Mechanical Engineers' Society, the President (Mr. Henry Adams) in the chair. After describing bygone blasting-powders and the early forms of gun-cotton and nitro-glycerine, the author came to modern explosives, which he described in detail. These included dynamite, blasting gelatine, Roburite, Securite, smokeless blasting-powder (S. B.), and others. While speaking of the manufacture of guncotton, the author said that in one manufactory there is an annual output of 3,500 tons. The picrate compositions were touched upon, with the various forms of detonators, and their practical effect was discussed.

Books.

Roofs and Bridges. Part II. Graphic Statics. By MANSFIELD MERRIMAN and HENRY S. JACOBY. New York: John Wiley & Sons.

THIS work forms one of the text-books of the course of instruction given in Lehigh University, where one of the authors, Mr. Merriman, is engaged as Professor of Civil Engineering, and the other, Mr. Jacoby, acts as Instructor. In dealing with roofs and bridges, students at this University divide the subject into four parts:—1. The computation of stresses in various styles of trusses. 2. The analysis of these stresses by graphic methods, as explained in the volume before us. 3. The design of a bridge, including the arrangement of details and preparation of working drawings. 4. The consideration of cantilever, suspension, continuous and arched forms. The "force polygon" (as the authors term it) is shown to be the foundation of the science of graphic statics, and the triangle of forces is treated as a particular case of a force polygon. For equilibrium to exist, not only must the algebraic sum of the components of the forces, measured in both a horizontal and a vertical direction, amount to zero, but the algebraic sum of the moments of these forces must also be zero, so that there may be no tendency to motion, either of translation or of rotation. To prove this the authors show the use of what they term an "equilibrium polygon," by means of which the exact line of action of the resultant of a number of forces acting upon a body is determined, the magnitude of the resultant being graphically found by the closing line of a force polygon. Equilibrium results when both the "force polygon" and the "equilibrium polygon" close. In all instances of non-equilibrium, where the force polygon closes, "a couple" is necessary to maintain equilibrium.

For any given number of forces it is clearly demonstrated that an infinite number of equilibrium polygons, or curves of equilibrium, can be constructed, varying according to the position of "the pole" of the force polygon from which point the rays, or the resolved components, of the given resultant forces are drawn. The pole may be taken either within or without the force polygon, as may be found most convenient for the solution of the problem under consideration. In dealing with parallel forces the pole must necessarily lie outside the force polygon. The resultant of any number of forces is a single force which would produce the same effect as the forces themselves, and may therefore replace them, whether the direction of these forces meet in a single point or not. The equilibrium polygon may be explained as consisting of an imaginary jointed frame, which holds the exterior forces in balance; and, viewed in this light, the authors show that when the equilibrium polygon does not close, the given forces cannot without the aid of additional force be held in equilibrium, but that if the force polygon closes, equilibrium may be effected by moving one or more of the given forces parallel to its direction, so as to bring its line of action through the angle of the equilibrium polygon, upon which it is necessary for the force in question to pass. The practical application of such graphic diagrams is shown in relation to various types of roof trusses and bridge girders, and the character of the stress in the individual members (tension or compression) of the equilibrium polygon is seen to be indicated by the component members of the force polygon. The book is well printed, and contains excellent diagrams. It is interleaved with blank pages for additional notes to be made by the student. Problems to be worked out are added at the end of each article, and answers to these problems are given in an appendix at the end of the volume.

Stone: How to Get it, and How to Use it. By Major-General C. E. LUARD (Retired), Royal Engineers. London: E. & F. Spon. 1890.

THIS little work is an introductory treatise on stone, adapted for the especial use of students in architecture, engineering, surveying, and estate agency, it having been originally written for the Surveyors' Institution. It commences by briefly referring to the bibliography of the subject, and this portion is supplemented by a useful list of works in the first appendix. Alluding to geological works, the author says, 'There is no more practically useful work in the whole list than Professor Ansted's Lectures on the Application of Geology to the Arts and Manufactures." This is quite true, but at the same time that work is rather antiquated, whilst it does not profess to be more than an outline. As a matter of fact, no really good work entering exhaustively into the different kinds of stone from both scientific and practical points of view, has yet been published in England; we have special treatises, but not general, and we heartily endorse the author's belief that the different kinds of stone have not yet been studied in a manner commensurate with the practical and pecuniary importance of the subject. A general account of the localties is then given, in which a few new openings are mentioned, whilst the next section deals with the renting and leasing of the same. This is by far the most important and original part of the work. The author explains the various methods of leasing quarries, of fixing minimum and "further" rents, and sums up the main causes of dispute, which he says "chiefly arise on whether the lessee was or was not making the most of the land entrusted to him." It is mentioned that people are too apt to treat the receipts from stone quarries as income in place of capital, and that in the case of entailed estates, a portion of this should be invested for the heirs to the estate, who are otherwise deprived for ever of this part of its value. Some of the principal steam-saws, tooling, and moulding machines are shortly discussed, after which the author devotes a few pages to the consideration of the comparative wear of stone, pointing out the great pecuniary advantages attaching to a proper understanding of the matter in respect of the maintenance of roads. The preservation and seasoning of stone, and a brief mention of some of the principal artificial stones in the market, appropriately form the conclusion. The appendices include also a list of granite quarries, the comparative prices of some igneous road-metals, a note on Bath stone, a table showing valuation of some Yorkshire quarries, and a list of persons who furnished the author with information during the preparation of the work. We observe that in giving the principal quarries of Bath stone the well-known Monk's-park stone is not mentioned. Altogether the author is to be congratulated on giving a very fair introductory treatise on stone to the students of the profession, and the arrangement of the work and the suppression of unimportant details are manifest indications of the selective care with which it has been prepared. We might point out, however, that the title is not well chosen, for we do not find much in the book as to the methods of getting stone, and there are no particular instructions as to "How to use it."

Practical Plane and Solid Geometry, including Graphic Arithmetic. By H. J. SPOONER, Assoc.Mem.Inst.C.E. Third edition. London: Cassell & Co. (Limited).

AN elementary treatise, forming one of the Polytechnic Series, written to meet the requirements of the Science and Art Department, South Kensington. Each chapter concludes with a series of examples to be worked out. Lines, angles, proportion, triangles, polygons, circles, and their combinations are dealt with, in addition to the construction of various conic sections, and a table of definitions with the derivation of the terms employed is introduced. The author very properly recommends that a student should first learn to draw accurately and neatly with his instruments, and he gives valuable suggestions as to drawing scales on a sheet of paper. He also adds useful hints to guide an inexperienced draughtsman in his work, with the object of obviating common errors. Graphic arithmetic, or the art of working by geometry various arithmetical processes, is dealt with. As a test of the students' reasoning powers in geometrical work the process is as ingenious as it is profitable, and it is useful in its application to graphic stresses in mechanics, but so far as ordinary arithmetic is concerned the numerical process is, in our opinion, preferable. In solid geometry the author deals at length with the question of simple projection, and argues that beginners frequently fail to make much progress owing to their want of this information. He asserts that the realisation of the projection of simple solids upon paper, according to special conditions, should precede that of the representation of points and lines in various positions in relation to the planes of projection, notwithstanding the fact that points and lines constitute the simplest element of a solid, because solids, being more tangible, can be taught *objectively*, and afterwards the relation of traces of lines and points may be more comprehensively grasped, when the solid with which they are connected is realised in projection. The idea is novel and worthy the attention of teachers. The type of the book is good, and the volume contains sufficient practical geometry for the work of any ordinary drawing-office.

Forty Lessons in Carpentry Workshop Practice. By CHALES F. MITCHELL. London: Cassell & Co. (Limited).

THE author of this book is the lecturer on carpentry and joinery at the Polytechnic Institute, London; and the work, which is illustrated by eighty-nine well-drawn diagrams, has been revised by Mr. G. C. Pope, the teacher of practical carpentry at the same Institute. The contents include a list of tools necessary for use in a workshop, a description of means employed for grinding and sharpening, sawing, planing, preparing a straight-edge, preparing winding-strips, taking timber out of winding, making a square or plain joint, grooved and tongued joint, plough-grooving and cross-tongues, &c. The descriptions form a useful account of what every well-trained carpenter and joiner is fully conversant with, but which students who spend no time in actual workshop practice desire to know.

Forty Lessons in Engineering Workshop Practice. By C. F. MITCHELL and A. G. DAVEY. London: Cassell & Co. (Limited).

THIS useful little manual, which forms one of the Polytechnic Series, has been prepared to assist students in the acquisition of such necessary technical knowledge as shall enable them to construct useful workshop tools. The lessons are arranged in a progressive manner, and the contents, which are clear and concise, have received the benefit of careful revision by Mr. J. Rogers, instructor in engineering workshop practice at the Polytechnic Institute. The book truly states that in these matters "experience is the best guide," but for all its statements the authors furnish reasons. The illustrations are clear and fully dimensioned. A perusal of the work by those whose duties are chiefly limited to the drawing-office, would prevent foolish questions being asked by inexperienced draughtsmen in the workshop. The book exhibits several details which require special attention in making "workshop drawings," and show a draughtsman what to observe as he walks through a manufacturer's yard and shops.

School Hygiene. By W. J. ABEL. London: Longmans, Green, & Co.

THIS little book contains clear, concise rules for the ventilating and warming of schools, the disinfecting of rooms, clothing, &c., and the periods of infectivity and length of quarantine necessary for all infectious diseases.

There is an excellent chapter on "Eyesight, and the Use of Test-types." Were this book in the hands of all school-masters and mistresses many a little scholar's sight might be saved the terrible strain to which it is often subjected by being given work to do and types to read which are too small.

There are also short rules for administering first aid in injuries; indeed the book is full of useful information, written so clearly that a child might understand. It is merely one of the army of hygienic books, but each one helps on the good cause. We do not hold to the doctrine that a little knowledge is a dangerous thing; provided the individual is aware that he knows but little, that little may prove a great boon to many. We hope that books on school ventilation may be unnecessary some day. There may be a happy time coming when a bill for "compulsory ventilation" will be passed, and every room in every house will have its fresh-air inlet, and its ventilated gas-ring as a foul air exit. Until that golden age shall come, and whilst children are growing up stunted and sickly in ill-ventilated rooms, let as many books be written on the subject as possible, and diffused throughout the country, so that "our sons may grow up as the young plants, and our daughters may be as the polished corners of the temple."

Blackie's Modern Cyclopædia. Edited by Charles Annandale, M.A., L.L.D. Vol. V. London, Glasgow, Edinburgh, and Dublin: Blackie & Son,

The fifth volume brings this encyclopædia down to the latter part of M., and it appears to keep up the good quality shown in the former volumes. Among the architectural subjects which come into this volume is "Impost" which is shortly and correctly treated and illustrated (time was when such a word, in its architectural signification, would never have found a place in a general dictionary); "Indian Architecture" has a short article with three or four rather inadequate illustrations, better than nothing however; "Ionic order," &c. The subject of "Iron-clad Vessels" receives very good illustration for a popular general dictionary, and is accompanied by plans and sections to a small scale of two of the latest English iron-clads. Under the heading "Kaulbach" is a short but very just review of that painter's position in art, his merits and defects. We may add that good small-scale maps are given of the principal countries described in the dictionary.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

5,175. Ventilating Apparatus. T. F. G. Wintour.

According to this invention, in the panes of the window two cones of metal, gauze-wire, india-rubber, &c., are inserted. These are fixed with a free air-space between the cones, and, if required, a mica valve to prevent the ingress or egress of air, if wished. The ventilation is controlled by means of the valve.

6,838. Stoves. G. A. Jones.

The stove which is the subject of this patent has a chamber, into which the products of combustion have to pass before they can get away through one or more flues connected to the lower portion of the said chamber for that purpose. In order to absorb and utilise the greatest amount of heat from this chamber, it is surrounded with a jacket open at bottom and top, which induces an upward current of pure air, which becomes heated in its passage. If a damp air is desired, an open vessel is placed on the top of the chamber, and kept supplied with water of any desired level by connecting to a water-supply of a similar level, so maintained by an inverted vessel on the principle of a "fowl fountain." As the water evaporates, the vapour mixes with the pure hot-air current, which is led in any direction by means of flues.

7,289. Improvements in Water-closets. B. R. Phillipson.

The form of water-closet which is the subject of this invention, and which may also be used as a slop-sink, is provided with two water-sealed traps in succession to each other. These have an air-space between them which is provided with a ventilation-pipe carried to the open air. An air-valve is fixed and so operated that when the water supply is open the air-valve is closed. When water is thrown into the basin from a pail or vessel it passes through the two seals without unsyphoning either of them, because the open ventilation between the two seals prevents syphonage. When water is sent into the basin from the cistern or supply, however, the air-valve is closed by a lever, and when a certain quantity of water has entered the basin, syphonage takes place, and the basin is discharged.

8,201. Window-sashes. W. Allenby.

According to this invention, in drop-windows, such as railway-carriage, tramcar, and other windows, the sash is held by the action of an india-rubber covered roller pressing against it. A little force will, however, raise or lower it, the elasticity of the roller then allowing the frame or window to move up and down.

20,957. Improvements in Water-closets. S. Mayo (U.S.A.).

In the form of water-closet which is the subject of this invention, and which is a modification of the "wash-out" closet, mechanism is described which connects the cover of the seat with the valve and flushing apparatus by which two washes or heads of water are allowed to enter the basin and effectually flush and cleanse it.

NEW APPLICATIONS FOR PATENTS.

March 24.—4,572, J. Watson, Stoves.—4,579, A. Harris, Drain-pipes, &c.—4,593, W. Baker, Fire-grates.

March 25.—4,603, C. Mackey, Roses of Door and other Knobs.—4,608, C. Longley, Wood-block Flooring.—4,662, J. Baly, Bevelling Square.—4,678, H. Hinckley, Indicators for Doors.

March 26.—4,702, J. Mayoh, Steel or Iron Plate or Joist for Supporting Floors, Walls, &c.—4,705, G. Tweedy and B. Lawrance, Wood Blocks for Roads and Pavements.—4,712, H. Doulton, Construction of Sewer.—4,718, A. Govan, Hanging Window Sashes.—4,735, F. Averill, Flush Bolts.—4,738, S. Haslam, Sash and Frame.—4,740, W. White, Sliding Sashes and Windows.—4,741, W. Gibbs, Cement Kilns, &c.—4,747, A. Richards, Draught Excluders for Doors.

March 27.—4,770, F. Botting, Actuating Outlet Valve of Valve Water-closet.—4,783, L. Groß, Screw Nail.—4,785, A. Stalker and T. Dayo, Supply Valves to Water-closets.—4,807, F. Laesecke and C. Riedel, Scaffolding Trestle.

March 28.—4,878, J. White, Door Springs.—4,882, J. Mason, Door Springs.—4,900, R. Roberts, Chimney Pots, &c.—4,907, Colthurst, Symons, & Co. and W. Pierce, Roofing Tiles.

March 31.—4,990, A. Booth, Sawing Machines.—4,995, G. Mansfield, Road Paving by Composite Block Process.—5,012, J. Tinline, jun., and S. Holt, Planing Wood.

PROVISIONAL SPECIFICATIONS ACCEPTED.

1,782, R. Ashworth and W. Evans, Self-acting Door Closer.—2,808, W. Noad, Whitelead.—2,841, R. Wilde, Dwelling and other Houses.—2,983, J. Collins, Sash-fastener and Lift.—3,215, R. Meredith, Fast-ning Door-knobs to their Spindles.—3,217, C. Spurr, Cutting Veneers.—3,336, T. Bibby, Saws, &c.—3,837, W. Thompson, Panel-doors, &c.—4,066, T. Tracy, Heating Rooms and Buildings.—4,150, T. Davie and A. Boutcher, Chimney Terminal or Cowl.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,953, J. Martindale, Cowls.—8,572, C. Taylor, Plane Irons.—8,863, Esdaile & Co., and L. Tavener, Saw-sharpening Machine.—8,914, A. Tonks and F. Baker, Flush-bolts.—14,137, B. Malcolm and W. Pennington, Holding Sliding Windows in any desired position.—15,355, S. Hill and R. Hodges, Catch and Bolt for Double Doors.—16,372, J. Mander, Sash-fastener.—16,781, C. Gabriel, Syphon-Cisterns for Flushing Water-closets, &c.—263, J. Seketchasy, Framework for Bridges.—2,625, J. Stevens and T. Birch, Weather-bars for Casement-sills.—2,879, J. Line, Paperhanger's Pattern-book.—3,021, J. O'Brien and J. Carew, Stone-cutting.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 27.—By H. Hayward.

Charlton, near Dover—52, High-st., f.	£520
8 and 9, Tower Hamlets-st., f.	210
Buckland, near Dover—66, London-rd., f., r. £19. 10s. p.a.	420
1, 16, and 17, Herbert-st., f.	331
Dover, Hawkesbury-st.—"The Railway Inn," u.t. 37 yrs., g.r. 10s. 11d.	560
57, 57½ 58, and 59, Bulwark-st., u.t. 5 yrs., g.r. £4. 18s.	122

March 31.—By Saml. B. Clark & Son.

Notting Hill-ter.—No. 28, f.	3,640
Marylebone—L.g.r. of £45 p.a., u.t. 27 yrs.	575
Fitzroy-sq.—12, Upper Charlton-st., u.t. 31 yrs., g.r. £24, r. £80	500
32, Clipstone-st., u.t. 32 yrs., g.r. £23, r. £128. 14s.	600
Manchester-sq.—20 and 21, North-st., u.t. 37 yrs., g.r. £40, r. £226. 4s.	1,000

By Messrs. Trollope.

South Kensington—4, Pelham-crescent, u.t. 29 g.r. £10., r. £105	900
4a, Pelham-st., u.t. 23 yrs., g.r. £2, r. £20	270

By Phillips, Lea, & Davies.

Battersea, Home-rd.—F.g.r. of £152, with reversion in 83 yrs.	3,665
Latchmere-st.—F.g.r. of £40, with reversion in 75 yrs.	955

By Maddox & Son.

St. John's Wood—18, John-st., u.t. 12 yrs., g.r. £3	195

April 1.—By F. Eiloart.

Notting-hill—F.g.r. of £20, with Reversion in 71 yrs.	515

By G. Brinsley.

Bermondsey—9, Star Corner, f., Yard, l.	720

By E. Holsworth.

Highgate—1 to 7 (odd) Twisden-rd., u.t. 83 yrs., g.r. £22	1,020

By Physick & Lowe.

Hampstead, Golder's Hill-rd.—Two plots of f. land	150

By Debenham, Tewson & Co.

Hoxton—196 and 200, Hoxton-st., f., r. £34 p.a.	1,270
Russell-sq.—30, Woburn-pl. and stabling, u.t. 30 yrs., g.r. £19, r. £140	1,230
Bethnal Green—192, Green-st., f., r. £50	700
45 and 47, Moss-st., f., r. £57. 4s p.a.	490
23 and 25, Harold-st., and 6, 7, and 8, Type-st., f., r. £75. 8s.	610
10, 12, and 14, Digby-st., and 26 and 28, Lansdell-pl., u.t. 17 yrs., g.r. £3	140
16 and 18, Norton-st., and 6 and 7, Type-st., u.t. 41 yrs., g.r. £3, r. £65	350
Mile End—L.g.r. of £19, u.t. 14 yrs., at a g.r. of £12	65
165 to 171 (odd), Globe-rd., u.t. 14 yrs., g.r. £13. 16s., r. £96. 4s.	220
The "Lord Nelson" beerhouse in Globe-rd., u.t. 14 yrs., g.r. £11, r. £70	335

April 2.—By Vaughan & Co.

Hampstead-rd.—41, Robert-st., u.t. 31 yrs., g.r. £7. 7s., r. £55	595
Lambeth—L.g.r. of £36 p.a., u.t. 17 yrs.	540

By F. Jolly & Co.

Bethnal Green—30, 50, and 54, Cyprus-st., u.t. 12 yrs., g.r. £6, r. £60	220
Ratcliff—23 to 29 (odd), Brook-st., and 1 to 6, Elisabeth-ct., u.t. 16 yrs., g.r. £32	£310

By Wagstaff & Warman.

Highbury-crescent—No. 15, f.	1,000

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; L.g.r. for leasehold ground-rent; I.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

Saturday, April 12.

Edinburgh Architectural Association.—Special Visit to the Buildings of the Edinburgh International Exhibition.

Monday, April 14.

Royal Institute of British Architects.—(1) Special General Meeting for Members only, to receive and consider a recommendation of the Council that Mr. Alfred Waterhouse, R.A., President, be requested to allow himself to be nominated as President for the ensuing year of office. (2) Tenth Ordinary General Meeting of the Session. Paper by Mr. John P. Seddon on "Church Fittings." 8 p.m.

Surveyors' Institution.—Adjourned discussion on Mr. T. W. Wheeler's paper on "Betterments." 8 p.m.

Society of Engineers.—Mr. W. H. Brothers on "Weighing Machinery and Automatic Apparatus in connection therewith." 7.30 p.m.

Clerks of Works' Association (Carpenters' Hall).—Eighth Annual Meeting. 8 p.m.

Liverpool Architectural Society.—Mr. W. B. Hill on "Ormskirk Parish Church." 7 p.m.

Tuesday, April 15.

Society of Arts (Applied Art Section).—Mr. C. Purdon Clarke on "Modern Indian Art." 8 p.m.

Institution of Civil Engineers.—Sir Frederick Bramwell, Bart., F.R.S., on "The Application of Electricity to Welding, Stamping, and other Cognate Purposes." 8 p.m.

Wednesday, April 16.

British Archæological Association.—(1) The Rev. Dr. Hooppell on "Excavation of the site of Vinovium, Durham." (2) Mr. Jas. H. Macpichael on "Baynard's Castle, and antiquities found on its site, 1889-90." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. Ambrose A. Myall on "Recent Improvements in Dredging Machinery." 7 p.m.

Society of Arts.—Mr. Talbot B. Reed on "Old and New Fashions in Typography." 8 p.m.

Royal Meteorological Society.—Four papers to be read. 7 p.m.

Thursday, April 17.

Guild and School of Handicraft.—Mr. W. B. Richmond, A.R.A., on "Gesso." 8 p.m.

Royal Archæological Institute.—(1) Mr. R. H. Busk on the "Sixth Centenary of Dante's Beatrice." (2) Mr. J. J. Doherty on "Bells: their history, uses, and inscriptions." (3) Mr. F. Haverfield on "Roman inscriptions found in Britain." 4 p.m.

Society for the Encouragement of the Fine Arts.—The Second Conversazione at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly, 8 p.m.

Friday, April 18.

Architectural Association.—Members' Soirée. 8 p.m.

Royal Institution.—Sir Frederick Bramwell, Bart., F.R.S., on "Welding by Electricity." 9 p.m.

Saturday, April 19.

Royal Institution.—Captain W. de W. Abney, F.R.S., on "Colour and its Chemical Action." 3 p.m.

Edinburgh Architectural Association.—Visit to Tantallon Castle.

Miscellanea.

Docks and Harbour at Mobile.—From a recent report of the British Vice-Consul at Mobile we learn that the long-talked-of scheme—the Mobile and Dauphin Island Railway and Harbour Company—is about to be carried out by an English Company, which is convinced that Mobile Bay, on account of its geographical position, depth of water, and ample ship room, should be the great port of the gulf. Ample docks will be built at deep water at the terminus of the railway, with all modern facilities for handling ocean freights. Mobile is the nearest gulf port to St. Louis, Cincinnati, Memphis, Chicago, and Kansas City, and a large part of imports and exports to and from these places will pass through Mobile when such terminal facilities are made.

Appointments.—Mr. J. D. Lewis, from the offices of Messrs. John Whalley & Son, surveyors, Chester and Birkenhead, has been appointed Assistant Road Surveyor of the Borough of Birkenhead, at a salary of 150*l.* per annum. The applications were very numerous.——Mr. W. H. Radford, C.E., Nottingham, has been appointed representative and consulting engineer in England for the Corporation of Durban in South Africa. He will, we understand, act conjointly with the London agents in ordering and testing the materials required for the waterworks extension. The cost of the new works when finally completed will be about 120,000*l.*

Strikes in the Building Trade Abroad.—Telegrams from Toronto state that a general strike for higher wages among the men employed in the building trade is in progress in that city. The stonemasons struck last week, and the bricklayers went out on Monday. About 2,000 men altogether will be affected. The men's demands are endorsed by the International Union, and some masters have conceded an advance to their men to induce them to continue at work. The carpenters and joiners are expected to strike in a few days. The strike of masons continues in Vienna, and building has been brought to a standstill.

The Lock-out of Kentish Brickmakers.—The dispute between the Kentish bargemen and the brickmasters assumed a new phase on Saturday, one which aroused hopes in many quarters that at last a way to a settlement was opened. Following a demonstration held on Good Friday, a meeting of bargemen and mates in the Sittingbourne district was held, at which representatives from Faversham, Rainham, Halstow, Conyer, and other places were present. A suggestion was put before the bargemen to withdraw their lists, one of the conditions which the brickmasters have insisted upon from the first. The matter was discussed at some length, and ultimately the following resolution was passed unanimously:—"That we withdraw the list issued by our society provided that the whole question be submitted by the Brickmasters' Association to the conciliation committee of the London Chamber of Commerce, such question to be settled by May 1, and that the prices laid down by the Chamber of Commerce shall be paid from the time of resuming work, and that every member of the Bargemen's Union shall be reinstated in the position previously held by him." A copy of the resolution was at once forwarded to the Kent and Essex Brickmasters' Association, who held a meeting at Cannon-street Hotel on Monday, when it was resolved:—"That the Association insists upon the absolute and unreserved withdrawal of the lists issued by the bargemen, and upon the bargemen returning to work at the old prices." And it was also resolved:—"That moulding shall cease not later than August 31, and that the make of bricks be reduced by 20 per cent.; that is, that one stool out of every five now worked be stopped." In consequence of the dead-lock, brickmasters have had to refuse large orders for bricks, and they are consequently losing custom that may perhaps never be recovered.

Portsea Synagogue.—The Hebrew Synagogue at Portsea was re-opened on Sunday, the 23rd ult., by the Delegate Chief Rabbi (the Rev. Dr. H. Adler), after restoration. The architect for the work was Mr. Harry A. Smith, of Gosport, and the contractor Mr. J. Dugan, of Portsea; the total cost has been 1,100*l.* A new porch has been erected, to avoid the panic which might otherwise ensue in the event of a hurried exit from the ladies' galleries. The reading-desk has been rebuilt, and the whole of the interior reseated. The ark, which was opened in the synagogue 175 years ago, has been carefully restored and preserved. The floor is laid in mosaic, by Mr. Ebner, of Old-street, London. The ark is surmounted by the first two letters in the Decalogue, in Hebrew, symbolical of the two tables of stone delivered to Moses on Mount Sinai, and stands on new circular polished marble steps, in lieu of the original wooden steps, a brass pulpit rising from same.

Technical Scales.—Messrs. Cassell & Co. issue a series of scales printed on slips of glazed cardboard and with a case to keep them in, under the name of the "Polytechnic Series Technical Scales." These give a number of scales, two on each strip on the opposite edges, each defined as the proportion of an inch to a foot and as the proportion to full size, thus: "Scale of one-fifth of an inch to a foot, or $\frac{1}{60}$." A scale of chords is added on each slip. They make a useful set, comprising a greater variety of scales than can be shown on any single scale of the ordinary make.

Association of Municipal and Sanitary Engineers and Surveyors.—The Council of the Association of Muncipal Engineers have transferred the following Graduates to the class of Members, they having obtained chief appointments, viz., Messrs. M. Aspinall, Town Surveyor, Stroud; C. H. Cooper, Surveyor to the Local Board, Wimbledon; J. Cook, Borough Surveyor, Lancaster; and H. W. Jamieson, Surveyor to the South Hornsey Local Board.

British Archæological Association.—At the meeting of this Association on Wednesday, April 2, Mr. J. W. Grover, F.S.A., in the chair, the arrangements for holding the congress at Oxford, to commence on July 7, were detailed. Mr. Loftus Brock, F.S.A., to illustrate Mr. Cust's lecture, exhibited a copy of "Le Bruin's Travels in the East," which contains curious seventeenth century panoramas of Smyrna and other places which were referred to. The chairman described two gold British coins, the obverses being imitations of the statue of Philip of Macedon, and the reverse of one of the coins a plain convex surface. Mr. Romilly Allen, F.S.A. (Scot.), described a remarkable base of a stone cross which exists in the churchyard at Rastrick, Yorks. It is covered with Late Saxon interlaced work and scroll of the same period, but very like some decorations of the thirteenth century. While there are many remains of the shafts of Saxon crosses, the bases do not frequently occur. The Rev. R. G. Irving, vicar of Rastrick, exhibited full-sized rubbings of the ornamentation. Mr. R. Peters rendered a description of further discoveries on the site of Launceston Priory, where, to erect a new gasometer, the site of the chancel of the Priory church was excavated. The plans exhibited show this to have been 66 ft. long from east to west within the walls, and 19 ft. wide. There are transept chapels to the west of the chancel. A paper was then read on "Gokewell Nunnery, Lincolnshire," prepared by Mr. E. Peacock, F.S.A., and read by Mr. W. de Gray Birch, F.S.A., in the author's absence. The buildings stood to the west of the village of Broughton, on a site where a farmhouse now exists, but the remains which were noted in the seventeenth century have been entirely swept away, and the site has been a matter of conjecture. The Rev. Henry Cust then proceeded to describe his journey to Smyrna and Ephesus, where he visited the principal remains, and found that Mr. Wood's excavations of the Temple of Ephesus were getting covered up, and will soon be difficult to trace. A fine series of photographs were exhibited, and also of the supposed columns from the Temple of Diana, now in Sta Sophia, Constantinople. Mr. G. Patrick exhibited an Ionic volute which he found at Ephesus several years ago.

The Wenham System of Lighting and Ventilating.—Early in the current year the *Journal of Gaslighting* noticed the adoption of the Wenham system of regenerative ventilating lighting at the Nottingham Free Library, under the direction of Mr. W. R. Chester, the Gas Engineer to the Corporation. The Library forms one wing of the Natural History Museum, which has for some time been undergoing repair. The work, however, the *Journal* reports, is now finished; and arrangements were made for the opening ceremony to take place on the 31st ult. As the museum will be open in the evening, the question of lighting had to be considered; and the experience of the Wenham system in the reading-room, where it had worked very satisfactorily, led to its extension to the museum. As in the installation in the other part of the building, any danger of heat from the lamps charring the beams of the ceiling has been avoided by the construction of four shafts running the whole length of the room. The heat of the lamps will be carried into the open air by tubes which also form ducts for the removal of vitiated, or partly vitiated, air from the room. This new lighting arrangement has been entirely carried out by the workmen of the Corporation, under Mr. Chester's supervision. The Wenham Company, we are asked to mention, have now added to their business in gaslighting and ventilation an electrical department, with especial reference to electric lighting.

Gift to Reading.—Mr. George Palmer, head of the Reading biscuit firm, and formerly M.P. for the borough, has just announced to the Town Council that he will give a park of 49 acres at the east end of the town for the public benefit of the inhabitants. He has promised to fence in the land, plant trees, and lay it out for cricket, tennis, football, and other games, and for public gardens. He asks that no intoxicating liquors should be sold upon the ground. Mr. Palmer has already given over 20 acres in another part of the town for a public recreation-ground near the Thames. The Town Council passed a vote of thanks to Mr. Palmer for his gift. Previous to his last generous offer a movement was initiated to erect a memorial to Mr. Palmer's munificence.—*Times.*

A Bristol Newspaper Office.—The *Printers' Register* describes the new offices of the *Western Daily Press* at Bristol, now nearly completed. Part of the building has been occupied since 1886. The façade is of fine red brick, with freestone courses and window-frames. The building stands at the corner of Baldwin-street,—the widest central thoroughfare in Bristol—and St. Stephen-street. For about a quarter of a century the *Daily Press* offices were situate in Broad-street, adjoining the chief municipal building, the Council House, but after several additions had been made to the original premises Mr. Macliver, the proprietor, decided to build new offices which could be fitted up to meet the modern requirements of newspaper work. A site was purchased from the Corporation at a cost of about 8,000*l.*, and on this the new building has been erected. On the ground-floor (there are no cellars) are the advertisement office—a splendid apartment—a publishing office from which the trade is supplied with papers, a machine-room, engine-room, and paper-store. The machine-room contains three Victory machines, and on these are printed the *Western Daily Press*, the *Bristol Evening News*, and the *Bristol Observer*. On the first floor are a suite of offices, including artists' room and store-rooms; the second floor accommodates the editors, sub-editors, and reporters; and on the third floor are the composing-room—which is lighted from two streets and from the roof—and the stereotyping-room, which contains, beside the usual appliances for stereotyping, a gas-engine and a Shanks' engraving machine. The whole of the building is heated by one fire and hot-water pipes. As a precaution against fire, all gas-pipes are of iron, and the brackets are not movable. On each floor there is a hydrant and hose, by Merryweather & Sons, London, with a very copious supply of water always under pressure. Pneumatic tubes, by Cooke, of York, communicate between the publishing and advertisement offices and the composing room and sub-editors' room. All telegrams are delivered by these tubes to the sub-editors without using a messenger, and by the same means advertisements are despatched from the advertisement office to the desk of the foreman in the composing room. The whole arrangements are planned to ensure despatch and the convenient working of the various departments, which are nine in number—namely, editors and sub-editors, reporters, readers, compositors, stereotypers, machinists, publishers, and commercial staff. No doubt the arrangements are very complete, but the *Printers' Register* omits to give the name of the architect.

Industrial Exhibitions.—In addition to the workmen's exhibition to which we have referred in one of our "Notes," two other exhibitions of the kind have been opened this week. On Tuesday the Duchess of Teck opened the fourth annual exhibition of the Hammersmith Industrial Exhibition Society, at Flora-gardens Board School, Hammersmith. The object of the society is to encourage the young to employ their spare time in the pursuit of industrial art. There are six hundred exhibits of work done by children, and for the best results one hundred prizes are awarded. On the previous day an industrial and art exhibition was opened at Bournemouth. It is described as the first venture of the sort in that fashionable watering-place.

Society of Arts.—The papers for the Wednesday evening meetings after Easter to the end of the session have been fixed as follows:—On April 16, "Old and New Fashions in Typography," by Talbot B. Reed; April 23, "Coal in the South-East of England," by William Whitaker, F.R.S.; April 30, "Photographic Lenses," by T. R. Dallmeyer; May 7, "The Aim and Scope of Higher Technical Teaching," by Dr. Percy F. Frankland; May 14, "Professor Elihu Thomson's Electro-Magnetic Induction Experiments," by Dr. J. A. Fleming; May 21, "The Mannesmann Process for making Seamless Tubes," by J. G. Gordon.

Reported Collapse of a Parish Church.—The newspapers report that the parish church of Helpringham, Lincolnshire, has been partially destroyed. Two large beams, each weighing more than a ton, supporting the east end of the nave, fell into the body of the church, smashing the pews and injuring the vault beneath. The roof, on losing the support of the beams, became displaced. No one was in the church at the time. In 1854 the spire was half destroyed by lightning.

The English Iron Trade.—The English iron market shows in somewhat better form this week, but the business doing is small. The prices of pig-iron are stronger, and this is partly due to the improved nature of the Cleveland ironmasters' returns for March, but partly also to a recovery in warrants. Middlesbrough pig-iron has gone up 3s. a ton. Scotch-makers' iron has also improved slightly for some brands. Bessemer iron is steady at former rates. There is less firmness in Lancashire pig-iron, but other districts report fair strength. Business still continues moderate in finished iron, and steel is also quiet. Rails are 5s. a ton lower, and steel plates are easier. Shipbuilders are not booking fresh work, while engineers are not receiving many new enquiries; still, both branches of trade keep fairly busy.—*Iron.*

PRICES CURRENT OF MATERIALS.

	£. s. d.	£. s. d.
TIMBER.		
Greenheart, B.G. ....ton	6 15 0	7 5 0
Teak, E.I. ....load	11 0 0	14 0 0
Sequoia, U.S. ....foot cube	0 2 3	0 3 0
Ash, Canada ....load	3 0 0	4 5 0
Birch ,, ...	3 0 0	5 0 0
Elm ,, ...	3 10 0	4 15 0
Fir, Dantzic, &c.	2 0 0	3 10 0
Oak ,, ...	2 10 0	4 10 0
Canada	5 10 0	6 10 0
Pine, Canada red	2 10 0	3 10 0
,, yellow	2 0 0	5 5 0
Lath, Dantzic ....fathom	5 0 0	6 0 0
St. Petersburg	5 0 0	7 10 0
Wainscot, Riga, &c. ....log	0 0 0	0 0 0
Deals, Finland, 2nd and 1st. std.		
100	8 0 0	11 0 0
,, ,, 4th and 3rd	7 0 0	7 10 0
Riga	7 0 0	8 10 0
St. Petersburg, 1st yellow	10 0 0	14 0 0
,, 2nd ,, ...	8 0 0	10 0 0
,, white	6 10 0	10 0 0
Swedish	7 10 0	15 10 0
White Sea	8 0 0	17 0 0
Canada, Pine, 1st	15 0 0	26 0 0
,, ,, 2nd	10 10 0	17 0 0
,, ,, 3rd, &c.	7 0 0	10 0 0
,, Spruce, 1st	8 15 0	11 0 0
,, ,, 3rd and 2nd ..	6 15 0	8 10 0
New Brunswick, &c.	6 0 0	8 10 0
Battens, all kinds	6 0 0	16 0 0
Flooring Boards, sq., 1 in., prepared, First	0 11 0	0 14 0
Second	0 8 0	0 10 6
Other qualities	0 6 0	0 7 9
Cedar, Cuba ....foot	0 0 4	0 0 4½
Honduras, &c.	0 0 4	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average ..	0 0 4½	0 0 6½
Mexican, cargo average	0 0 4½	0 0 5½
Tobasco ,, ...	0 0 5½	0 0 6½
Honduras ,, ...	0 0 5½	0 0 6½
Box, Turkey ....ton	4 0 0	12 0 0
Rose, Rio	15 0 0	20 0 0
Bahia	14 0 0	18 0 0
Satin, St. Domingo ....foot	0 0 6	0 1 3
Porto Rico	0 0 10	0 1 3
Walnut, Italian	0 0 4½	0 0 7
METALS.		
IRON—Bar, Welsh, in London tn	8 2 6	8 10 0
,, at works in Wales	7 15 0	8 0 0
,, Staffordshire, in London ..	8 10 0	9 10 0
COPPER—British, cake and ingot	53 0 0	53 10
Best selected	55 0 0	56 0 0
Sheets, strong	62 0 0	0 0 0
Chili, bars	48 10 0	0 0 0
YELLOW METAL ....lb.	0 0 5½	0 0 6
LEAD—Pig, Spanish ....ton	12 10 0	0 0 0
English, com. brands	12 12 6	12 15 0
Sheet, English	14 10 0	0 0 0
Pipe	15 0 0	0 0 0
TIN—Straits	90 10 0	0 0 0
Australian	90 10 0	0 0 0
English Ingots	94 10 0	0 0 0
OILS.		
Linseed ....ton	23 0 0	23 5 0
Cocoanut, Cochin	28 10 0	0 0 0
Cocoanut, Ceylon	25 5 0	0 0 0
Palm, Lagos	24 10 0	24 15 0
Rapeseed, English pale	32 5 0	0 0 0
,, brown	30 15 0	0 0 0
Cottonseed, refined	22 5 0	0 0 0
Tallow and Oleine	21 0 0	40 0 0
Lubricating, U.S.	5 10 0	6 0 0
,, refined	7 0 0	12 0 0
TAR—Stockholm ....barrel	1 5 6	0 0 0
Archangel	0 16 9	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BANSTEAD (Surrey).—For extension of tailors' shop at the cottage home, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied:—

W. F. & W. Small & Co.	£468 12 0
J. B. Potter	387 0 0
W. Taylor	360 0 0
Barton & Son, Croydon (accepted) ..	336 0 0

BRISTOL.—For the completion of St. Francis's Church, exclusive of upper part of tower. Mr. John Bevan, architect:—

A. J. Beaven (accepted)	£2,600 0 0

[No competition.]

CLACTON (Essex).—For detached house on site adjoining the Valley Farm, Clacton, near Colchester, for Dr. J. C. Burnett. Mr. Alfred Broad, architect, 27, Dingwall-road, Croydon. Quantities by the architect:—

Chambers, Colchester	£962 0 0
Smith & Bulled, Croydon	913 0 0
Diss, Colchester	885 0 0
Dobson, Colchester	879 0 0
Everett & Son, Colchester (accepted)	810 0 0
Orfeur, Colchester	815 0 0
Allen, Clacton	807 0 0
Ambrose & Co., Colchester	794 0 0
Sergant, Clacton	761 0 0

[Architect's estimate, £850.]

CLACTON (Essex).—For detached cottage, Foots Farm, for Dr. J. C. Burnett. Mr. Alfred Broad, architect, 27, Dingwall-road, Croydon. Quantities by the architect:—

Chambers, Colchester	£553 0 0
Smith & Bulled, Croydon	504 0 0
Dobson, Colchester	475 0 0
Allen, Clacton	447 0 0
Diss, Colchester	441 0 0
Everett & Son, Colchester (accepted)	436 0 0
Orfeur, Colchester	420 0 0
Ambrose & Co., Colchester	409 0 0
Sergant, Clacton	368 0 0

CROYDON.—For detached cottage, Warrington-road. Mr. Alfred Broad, architect, 27, Dingwall-road, Croydon. Quantities by the architect:—

Waller	£480 0 0
Goulder & Glasscock	449 0 0
Knight	425 0 0
Docking	425 0 0
Page	415 0 0
Smith & Bulled	414 0 0
E. J. Saunders*	410 0 0

[All of Croydon.]

* Accepted, subject to revision.

DENFORD (Northamptonshire).—For erecting Wesleyan Chapel. Mr. John Wills, architect, Derby:—

W. Coates & Son, Thrapston	£500 0 0
Smith & Son, Raunds	465 0 0
Freeman & Son, Denford (accepted).	439 15 0

FAIRFIELD (Lancs.).—For the erection of one pair of semi-detached houses at Fairfield, for Mr. Jno. Swindells. Mr. J. H. Barton, architect, Warrington-street, Ashton-under-Lyne:—

Robinson & Co., Hyde	£2,201 0 0
Hannah Fielding, Droylsden	2,121 0 0
Hy. Gardner & Co., Ashton-under-Lyne	1,990 0 0
J. W. Williamson, Ashton-under-Lyne	1,920 0 0
Washington Hurst, Droylsden	1,906 6 0
Jabez Gibson, Dukinfield	1,880 0 0
R. Whitell, Manchester	1,800 0 0
Jno. Robinson, Ashton-under-Lyne	1,786 0 0
R. H. Booth, Stalybridge	1,784 10 6
Allen Holmes, Ashton-under-Lyne	1,779 14 1
T. G. Shaw, Stalybridge	1,770 13 0
Underwood and Bro., Dukinfield ..	1,751 12 0
E. & C. Jackson, Openshaw	1,746 0 0
C. Wallworth, Gorton (accepted)..	1,710 0 0
Thos. Dean, Ashton-under-Lyne ..	1,677 0 0

KILBURN.—For preliminary contract for basements, &c., to business premises, High-road, for Mr. George Nesbitt. Mr. E. D. Hanson, architect, Kilburn. Quantities by architect:—

J. Aney	£2,217 0 0
Gould & Brand	2,177 0 0
G. Neal	2,168 0 0
W. Brass & Son	2,147 0 0
H. B. Oldrey (accepted)	2,145 0 0

LONDON.—For enlarging the Rotherhithe Infirmary, for the Guardians of St. Olave's Union. Messrs. Newman & Newman, architects and surveyors, 31, Tooley-street, London Bridge. Quantities supplied:—

Shillitoe & Co.	£36,500 0 0
J. Butlers	35,300 0 0
Hart Bros.	34,662 0 0
Bottrill & Sons	34,590 0 0
J. Greenwood & Son	34,286 0 0
H. L. Holloway	33,977 0 0
Kirk & Randall	33,921 0 0
G. E. Todd	32,890 0 0
J. & W. Pattinson	32,878 0 0
Longley & Co.	32,800 0 0
Deacon & Co.	32,700 0 0
Brass & Son	32,555 0 0
Spencer & Co.	32,250 0 0
Balaam Bros.	31,566 0 0
J. O. Richardson*	30,857 0 0

* Accepted, subject to inquiries.

LONDON.—For the erection and completion of two new warehouses and river wall at Wapping, for Sir Andrew Lusk & Co. Messrs. T. Chatfeild Clarke & Sons, architects. Quantities by Messrs. H. H. Leonard & Clarke:—

Brown	£13,245 0 0
Woodward	13,197 0 0
Rider & Sons	12,990 0 0
Ashby Bros.	12,990 0 0
J. & J. Greenwood	12,820 0 0
Colls & Son	12,780 0 0
J. Morter	12,685 0 0
Lawrence & Sons	12,350 0 0
E. E. Nightingale	11,240 0 0
Higgs & Hill	10,980 0 0
Holloway Bros. (accepted)	10,788 0 0
Mattock Bros.	10,333 0 0

LONDON.—For erecting new Congregational Church at Barry-road, East Dulwich. Mr. W. D. Church, architect, 12, South-place, Finsbury, E.C. Quantities by Messrs. C. Stanger & Son, 21, Finsbury-pavement, E.C.:—

H. Everitt & Son, Colchester	£12,298 0 0
W. Shurmur	12,000 0 0
Woodward & Co.	11,770 0 0
Perry & Co.	11,767 0 0
Staines & Son	11,626 0 0
Dove Bros.	11,215 0 0
Hart Bros.	11,098 0 0
Colls & Sons	11,031 0 0
F. & H. F. Higgs	10,949 0 0
Killby & Gayford	10,500 0 0
Higgs & Hill	10,436 0 0
J. & C. Bowyer	10,155 0 0
Holloway Bros.*	9,640 0 0

* Accepted at revised estimate, £7,191.

LONDON.—For new lecture-theatre, museum, &c., for the Royal Veterinary College, Camden Town. Mr. Arthur Vernon, architect, 28, Great George-street, Westminster:—

Holland & Hannen	£5,658 0 0
Aldin Bros. & Davies	5,300 0 0
Dove Bros.	4,975 0 0
Bywaters	4,848 0 0

LONDON.—For re-building a warehouse in Wormwood-street, E.C., for Messrs. Fitch & Son. Messrs. Hammack & Lambert, architects, 59, Bishopsgate-street, E.C.:—

J. Hearle & Son	£4,350 0 0
Dove Bros.	3,775 0 0
E. Lawrance & Sons	3,595 0 0
Thomas Boyce	3,541 0 0
Higgs & Hill	3,494 0 0
Colls & Sons	3,460 0 0
Holland & Hannen	3,350 0 0
Ashby & Horner	3,296 0 0

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom Required.	Premium.	Designs to be delivered.	Page
Plans for Schools	North Wales University College	Four of 20 Guineas	April 23rd	ii.
Public Library	Whitechapel Commrs.	Not stated	Not stated.	ii.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Erection of Cottages at Abergwynfi	Great Western Ry. Co.	*Official*	April 16th	ii.
Cemetery Chapels and Lodge	Putney Burial Board	J. C. Radford	April 18th	ii.
Roadmaking Works, Tunbridge Wells	....	.... do.	do.	xii.
Filth Hoists, &c., Barking Outfall	London County Council	*Official*	April 21st	ii.
Water Mains	Sevenoaks R.S.A.	T. Hennell	April 22nd	xi.
Day and Jobbing Works (Sewers and Drains)	St. Mary (Islington) Vestry	*Official*	do.	xi.
Pipe Sewers, &c.	Lewisham Bd. of Works	do.	do.	xi.
Road Materials	do.	do.	do.	xi.
Pointing Brickwork	Holborn Union	H. Saxon Snell & Son	April 23rd	xii.
Warehouse and Factory, Bristol	Chas. Wills, Esq.	H. Williams	April 24th	xi.
Depot and Store, Upper Thames-street	Com. of Sewers	*Official*	April 25th	ii.
Schoolrooms, Swimming Bath, &c., Hanwell	Central Lond. Sch. Dist.	H. Jarvis & Son	April 28th	xi.
New Outlet Sluice	Essex Sewers Com.	G. Bickman Barnes	do.	xii.
Supply of Road Materials, &c.	Colchester Town Cour.	H. Goodyear	April 28th	ii.
New Station, Birkenhead; Verandah Roof, Chester	L. & N. W. & G. W. Rys	*Official*	April 29th	ii.
Painting, &c., Christ Church, Endell-st. W.C.	*	....	Not stated.	xii.
Church and Schools, Havant	The Committee	A. E. Stallard	do.	xii.
Palace of Varieties, West Hartlepool	....	Freeman & Robins	do.	xi.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Assistant Surveyors (R.E. Dept.)	Civil Service Commission	Not stated	April 26th	xvi.
Waterworks Clerk of Works	Leeds Waterwks Com.	3l.	Not stated.	xvi.

LONDON.—For alterations and additions to Nos. 29 and 30, Beaumont-street, W. Mr. Thomas Durrans, architect, 44, Upper Baker-street, W. :—

Ward, Clarke, & Co.	£1,969	0	0
Clifton	1,680	0	0
Turtle & Appleton	1,550	0	0
Aitchison	1,492	0	0
White (accepted)	1,489	0	0
Higgs (withdrawn)	1,195	0	0

LONDON.—For alterations at "The Lyric" Tavern, Windmill-street, Shaftesbury-avenue. Mr. John Cox Dear, architect, 117, Great Russell-street, Bloomsbury. Quantities by Mr. John Leaning, 11, Poultry, E.C. :—

Drew & Cadman	£1,470	0	0
Patman & Fotheringham	1,463	0	0
Lascelles	1,430	0	0
Tyerman	1,300	0	0
Chappell	1,296	0	0

LONDON.—For alterations and additions to 8, Springfields, Upper Clapton. Mr. J. Hamilton, architect :—

Fox & Co.	£720	0	0
Kellaway	640	0	0
S. Hayworth & Son	547	0	0
Beal	542	0	0
Snewin Bros. & Co.	495	0	0
Godfrey & Co.	474	0	0

LONDON.—For new fittings, &c. to the "George and Dragon," St. John's Street-road, Clerkenwell, E.C., for Mr. W. Pierpoint. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W. :—

T. Heath, Goswell-road (accepted) .. £515 0 0

LONDON.—For alterations and restorations after fire to internal portion of premises at 101, Queen Victoria-street, E.C. Mr. J. Williams Dunford, architect :—

F. J. Coxhead, Leytonstone* £909 0 0
* Accepted.

LONDON.—For pulling down and rebuilding premises, No. 2, High-road, Clapton, for Mr. G. Charlton. Mr. T. Laurie, architect :—

F. J. Coxhead, Leytonstone* £621 0 0
* Accepted.

LONDON.—For erecting timber-shed at Plough-road, Rotherhithe :—

F. J. Coxhead, Leytonstone* £184 0 0
* Accepted.

LONDON.—For painting and general repairs at "The Sir Robert Peel" public-house, Shrubland-road, Dalston, N.E., for Messrs. Watney & Co. Mr. J. G. Emor, architect :—

Oldrey & Co.	£167	0	0
Anley	153	0	0
Spencer & Co.	135	0	0
Jocelin & Young	130	0	0
Robert Eddie	128	10	0

LONDON.—For new office and alterations to saloon bar at "The Clarence" public-house, Seven Sisters-road, N., for Mr. James Kirk. Messrs. Wylson & Long, architects, 15, King William-street, Strand :—

Robert Eddie, 17, Tyndal-place, Upper-street, N. (accepted) £600 0 0

LONDON.—For new shop front, &c., at 14, Brewer-street, Regent-street, for Mr. C. W. Austin. Messrs. Wylson & Long, architects, 15, King William-street, Strand :—

Robert Eddie (accepted) £188 0 0

ORPINGTON. — For alterations and additions to High Elms, Orpington, for Sir John Lubbock, Bart. Messrs. Romaine-Walker & Tanner, architects :—

Brass & Sons	£1,133	0	0
Hall, Beddall, & Co.	985	0	0
Holloway Bros. (accepted)	912	0	0

RICHMOND (Surrey).—For new sewers in Kew and Sandycombe-roads. Mr. Walter Brooke, Town Surveyor :—

Tomes & Wimpey, Hammersmith	£8,645	0	0
Nowell & Robson, Kensington	8,300	0	0
L. Bottoms, Upper Tooting	6,980	0	0
A. Kellett, Ealing	6,598	0	0
T. Atkins, Kingston	5,400	0	0
J. G. B. Marshall, Brighton	4,988	0	0
J. Bloomfield, Tottenham	4,907	0	0
H. Hill, Maidenhead	4,629	14	11
D. W. Lewis, Southsea, Hants	4,590	0	0

[Surveyor's estimate, £5,314.]

SAWBRIDGEWORTH (Herts.).—For the erection of a pneumatic malting, at Sawbridgeworth, Herts, for Mr. E. B. Barnard. Messrs. Inskipp & Mackenzie, architects, 5, Bedford-row, W.C. Quantities by Messrs. R. L. Curtis & Sons :—

Hunt, Hoddesden	£14,985	0	0
Jas. Morter, London	13,593	0	0
Kirk & Randall, Woolwich	13,125	0	0
J. & A. Brown, Braintree	12,200	0	0

SOUTHAMPTON.—For the new Church of S. Mark, Archer's-road. Messrs. J. E. K. & J. P. Cutts, architects, 28, Southampton-street, Strand, London :—

W. R. & C. Light, Portsmouth	£6,521	0	0
Stevens & Bastow, Bristol	6,499	0	0
J. Dyer & Sons, Southampton	6,300	0	0
J. Parnell & Son, Rugby	6,222	0	0
R. Carter & Son, Winchester	6,106	0	0
H. I. Sanders, Southampton	5,989	0	0
T. H. Kingerlee, Oxford	5,963	0	0
Bull & Sons, Southampton	5,797	0	0

SOUTHEND-ON-SEA. — For rebuilding the "Old Grotto," Marine Parade, Southend-on-Sea, for Mr. W. H. Collier. Mr. J. H. Smith-Smyth, surveyor, Tottenham :—

G. A. Collier, Milner-street, Islington (accepted) £750 0 0

TOTTENHAM. — For erecting billiard-room at the "Black Boy" Hotel, for Mr. C. W. Tame. Messrs. Hodson & Whitehead, architects, 7, Finsbury-square, E.C. :—

N. A. Brown (accepted) £430 0 0

WATLINGTON (OXON.).—For building new church, Christmas Common, near Watlington, Oxon. Mr. Walter F. Cave, architect, 8, George-street, Portman-square :—

Robert M. Hamilton, Henley-on-Thames	£800	0	0
Claridge & Bloxam	720	0	0
W. Lawrence, Whitchurch	665	0	0
E. Williams, Abingdon	553	0	0
John Grant, Banbury	495	0	0
Harry Harris, West Wycombe	456	0	0
George Glanville, Fyrton (accepted)	455	0	0
George Henry Wheeler, Abingdon	449	0	0

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